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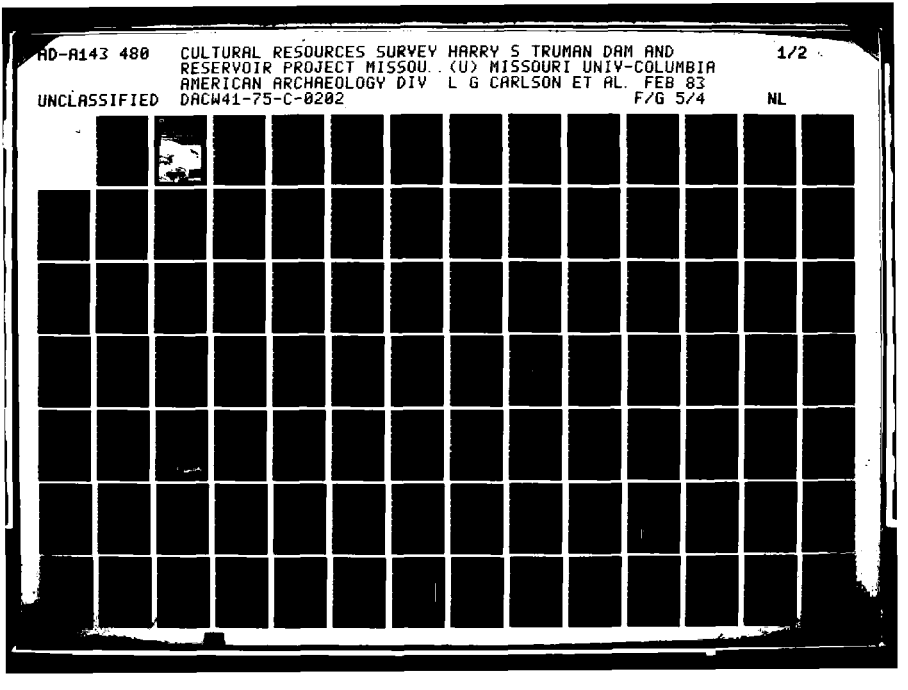

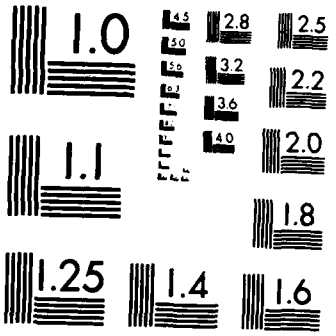

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US Army Corps
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Kansas City District

Harry S. Truman Dam and Reservoir, Missouri

American Archaeology Division Department of
Anthropology, University of Missouri - Columbia
Columbia, Missouri

Cultural Resources Survey Harry S. Truman Dam and Reservoir Project

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Artifact Analysis	Osage River	Tebo Creek

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The ten volumes report the results of a cultural resources survey in the Harry S. Truman Dam and Reservoir Project, Henry, Benton, St. Clair, and Hickory counties in southwestern Missouri. The combined volumes relate the findings of historical, architectural, archeological surveys conducted between 1975 and 1977. Volume I contains an outline of Osage River history to serve as a background for historical studies; Volume II is a historical gazeteer. Volume III contains the architectural survey of the reservoir. Volumes IV

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through IX report the archeological survey of the reservoir. Volume IV is a description of the archeological survey, the results of that survey, and an analysis of prehistoric settlement-subsistence patterns in the reservoir area. Volume V contains analyses of surface collections obtained during the survey, and includes studies of chipped stone tools, ground stone tools, hematite, ceramics, and projectile points.

Volume VI consists of an interpretation of the Euro-American settlement of the lower Pomme de Terre River valley. Volume VII is a study of the results of preliminary testing at several sites in the lower Pomme de Terre River valley. Volume VIII contains the results of excavations in rock shelters along the Osage River. Volume IX contains studies relating to tests conducted in early occupation sites in the reservoir area, and an analysis of some Middle Archaic materials.

Finally, Volume X contains four environmental study papers, detailing the bedrock and surficial geology, the historic plant resources, and special studies of the soils and geology or portions of the reservoir.

Block 7.

Russell L. Miller, Stephen A. Chomke, Andrea L. Novick, Charles E. Cantley, Janet E. Joyer, R. A. Ward, T. L. Thompson, C. V. Haynes, F. B. King, and D. L. Johnson.

CULTURAL RESOURCES SURVEY
HARRY S. TRUMAN DAM AND RESERVOIR PROJECT
VOLUME VI
EURO-AMERICAN SETTLEMENT OF THE LOWER POMME DE TERRE RIVER VALLEY

by

Russell L. Miller

A PROJECT CONDUCTED FOR THE
U. S. ARMY CORPS OF ENGINEERS
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AMERICAN ARCHAEOLOGY DIVISION
DEPARTMENT OF ANTHROPOLOGY
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1983

REPORTS OF THE

CULTURAL RESOURCES SURVEY

HARRY S. TRUMAN DAM AND RESERVOIR PROJECT

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PREFACE

We began the following study when the American Archaeology Division, Department of Anthropology, University of Missouri-Columbia, undertook a Cultural Resources Survey of the Harry S. Truman Dam and Reservoir Project in southwestern Missouri, under contract with the United States Army Corps of Engineers in 1975.

Our particular work dealing with settlement relationships represents an initial step of a continuing multi-stage approach to Euro-American ethnoarcheological investigations in the lower Pomme de Terre River valley of the reservoir area. It is to supplement and complement both the prehistoric archeological and historical cultural surveys as they are prescribed within the general "scope of work" (Appendix A). Our preliminary report to the Corps (Miller: 1977, vol. 6) is in a more general form (than this report) as it is not for the archeological community.

The report encompasses discussions of the general approach and operations entailed in producing the results of the first stage of the research. It covers a preliminary settlement analysis of the research area as well as a summary and recommendations regarding the future stages of research.

We express our appreciation to both the University of

Missouri-Columbia and the U.S. Army Corps of Engineers for the opportunity to add to this interdisciplinary research project.

Thanks must go to Dr. W. Raymond Wood for extending the offer to participate in the research as well as always being there when needed and to Dr. Donna C. Roper for her continuous guidance and patience during the many months of work.

Additionally, the work would not have been possible without the assistance of many individuals. Although it would be impossible to name all of those who gave so freely of their time and effort, their assistance is nonetheless greatly appreciated.

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Gratitude goes to Professor Stanley South, Cynthia R. Price, James E. Price and colleagues William B. Butler, Dr. Ann M. Johnson, Stephen A. Chomko and Alan S. Downer who spent time discussing many aspects of this research.

A special thanks is extended to computer analyst Norman H. Howden who stood fast during many changes in the research design.

The staffs of several document libraries were

extremely helpful. I especially thank Ms. Pauline Irvine, Archivist (Archives, Office of Secretary of State, State of Missouri); the staffs at many county court houses and historical societies; and to Jesse J. Felix (Bureau of Land Management, Washington D.C.).

I also express my thanks to those who offered constructive comments from the United States Department of the Interior, National Park Service and the U.S. Army Corps of Engineers.

Special thanks to Drs. Carole C. Crumley and W. Raymond Wood whose combined effort as advisors kept me headed in the right direction and to Drs. Robert F. G. Spier, Carl H. Chapman and Professor Walter A. Schroeder for their continuous guidance and profitable discussions as members of my graduate committee.

Paula L. Miller was involved with every phase of the research, especially microfilm reading, the editing and rough typing of the manuscript and my many ups and downs of enthusiasm. For her, I give deepest thanks.

Finally, I wish to thank the individuals in Wheatland, Missouri and in all parts of the research area who extended most courteous and sincere friendship during the period of research.

R. L. Feeser-Miller

EURO-AMERICAN SETTLEMENT: LOWER POMME DE TERRE RIVER VALLEY

by

Russell L. Miller

ABSTRACT

The development of preliminary models pertaining to relationships between settlements and their natural environment is the first step in an attempt to interpret cultural processes involved in the selecting of land in the lower Pomme de Terre River Valley. Regional settlement studies are aided by ethnohistoric documentation, vegation models, a form of "site-catchment" analysis, and a computerized mapping system. Using arbitrary periods of time as phases of settlement, one surmises that individuals rationally selected different catchments in both spatial and temporal sequence. These patterns are directly related to cultural processes in force at the time of purchase. Initial data have relevance in later analysis and construction of predictive models pertaining to historic and prehistoric site location.

CHAPTER I

INTRODUCTION

Background to Research Design

Our current research grew from a need for data to answer additional questions regarding the research design for a cultural resource survey of the Harry S. Truman Reservoir. The orientation of the reservoir research was the result of more than a decade of previous work in the Pomme de Terre River valley to attempt to "outline the past environments of the Ozarks, and to understand how man adapted to and perhaps modified those environments" (Wood 1976:9).

The early research focused on the archeology of Rodgers Shelter, a stratified site reflecting 10,500 years of human occupation. These excavations presented the possibility of designing a model involving cultural-environmental relationships which could be used to explain human activity and interactions with the area around Rodgers Shelter (Wood and McMillan 1976).

It only followed that to totally understand the cultural development and changes involved within the Pomme de Terre valley, it is necessary to examine man's presence

from the cultural sequences represented in the shelter, and ultimately cover paleo-indian to present-day cultural traditions. The mechanisms were then placed in motion to discuss and explain man's use of his environment in the valley through an interdisciplinary approach (Appendices A and B).

Therefore, the present research strategies regarding Euro-American populations in the lower Pomme de Terre River valley will act as a bridge between late prehistoric and historic cultural sequences within the research area.

Our study was begun by initially developing frontier models of settlement-subsistence changes with the entire approach based on anthropological concepts.

With some three hundred square miles designated as the research area and a time parameter from 1837 to 1917, we proceeded to divide the total approach into a number of research stages. Each stage contains objectives or steps which are ordered in such a way as to aid in the operationalization of the overall cultural survey.

Stage I.

A. Establish initial location of Euro-American ownerships within the research area.

B. Infer from ownerships, possible land use as related to ecological situations.

C. Compare and contrast settlement and adaptation patterns to those of prehistoric peoples.

Stage II.

A. Infer cultural processes which took place from the material culture represented in both intra and inter site situations.

Stage III.

A. Using results from stages I and II, infer related cultural processes involved both within and outside the research area.

Four modifications were made as the research continued. First, due to the extensive amount of time needed to gather the data on prehistoric sites as well as an analysis and explanation of the settlement patterns involved, it was necessary to move step C of stage I, which addresses the objective of comparing and contrasting historic and prehistoric settlements, to stage III.

Secondly, we were forced to reduce the total research area for this initial report. It was concluded that a smaller area would enable us to control the data more precisely and assist us in presenting the data more easily in visual form by way of settlement mapping.

The third modification dealt with the enlargement of scope regarding the research area. It became evident that a view of the cultural traditions over the total reservoir, and not just the Pomme de Terre valley, would offer a more complete picture of settlement pattern and adaptation (Roper and Wood 1975: 2). The level of questions to be answered

were: (1) the nature of settlement systems in the Pomme de Terre valley, (2) the relationship of this segment of the Osage River basin to the remainder of the reservoir and to western Missouri in general, and (3) the nature of general principles of how people use their natural environment and why changes occur.

The above format was later somewhat changed and re-ordered into four levels of questions which placed the Pomme de Terre River area into "an importance proportional only to its size relative to the area of the reservoir" (Roper 1977: 2).

Our fourth modification related to the total field of anthropology and what importance ethnoarcheological studies have in the present movement of historic preservation. These questions were viewed as separate from the others which called for the creation of another stage of objectives (stage IV).

Our most immediate direction, however, remained in answering questions related directly to the lower Pomme de Terre River valley.

Three Levels of Questions

Having briefly explained the basic background of our research design and the changes related to the overall approach to the reservoir, we may now state some very general questions which hopefully will be answered in part

at the completion of our four stage research. More detailed questions pertinent to the work done for this thesis will follow in chapter IV.

It should be understood that the general questions to some extent parallel Roper's (1977: 4,5) four levels of questions since we are both attempting to understand and explain settlement systems related to prehistoric and historic cultures.

Our first level of questions centers on Euro-American settlement systems in the lower Pomme de Terre River valley.

1. What types of settlement patterns and systems are evident in both documented and mitigation surveys?
2. How are these types related to ecological and cultural processes?
3. Is there evidence of rational behavior involvement regarding settlement systems?

The second set of questions focuses on placing the lower Pomme de Terre River valley in perspective with the central Osage River valley.

1. How are the same settlement systems represented throughout the reservoir, or are they limited to certain portions?
2. Is there evidence of additional types of settlement systems? If so, what are the settlement patterns?

3. Does the use of the ecological system change over time? If so, how? How does spatial variation effect the settlement systems?

The third level is related to theoretical and historic preservation concepts.

1. How does this type of inquiry articulate with the goals of anthropology?
2. What relevance do these ethnoarcheological studies have in the historic preservation movement?

Finally, the basic questions used in the analysis of this first stage of research entailed an extensive survey of initial government land acquisition records, the development of a computer mapping display system, and an extensive ethnohistorical inquiry of the population involved in the research area.

The graphic representations of the research design utilized in the overall project (Figure 1) show the levels of questions and operations used in stage I. It can be seen that the inter-relationships of this analytical system will eventually lead to reevaluation and structuring of questions to gain additional knowledge toward explanations of Euro-American settlement-subsistence systems.

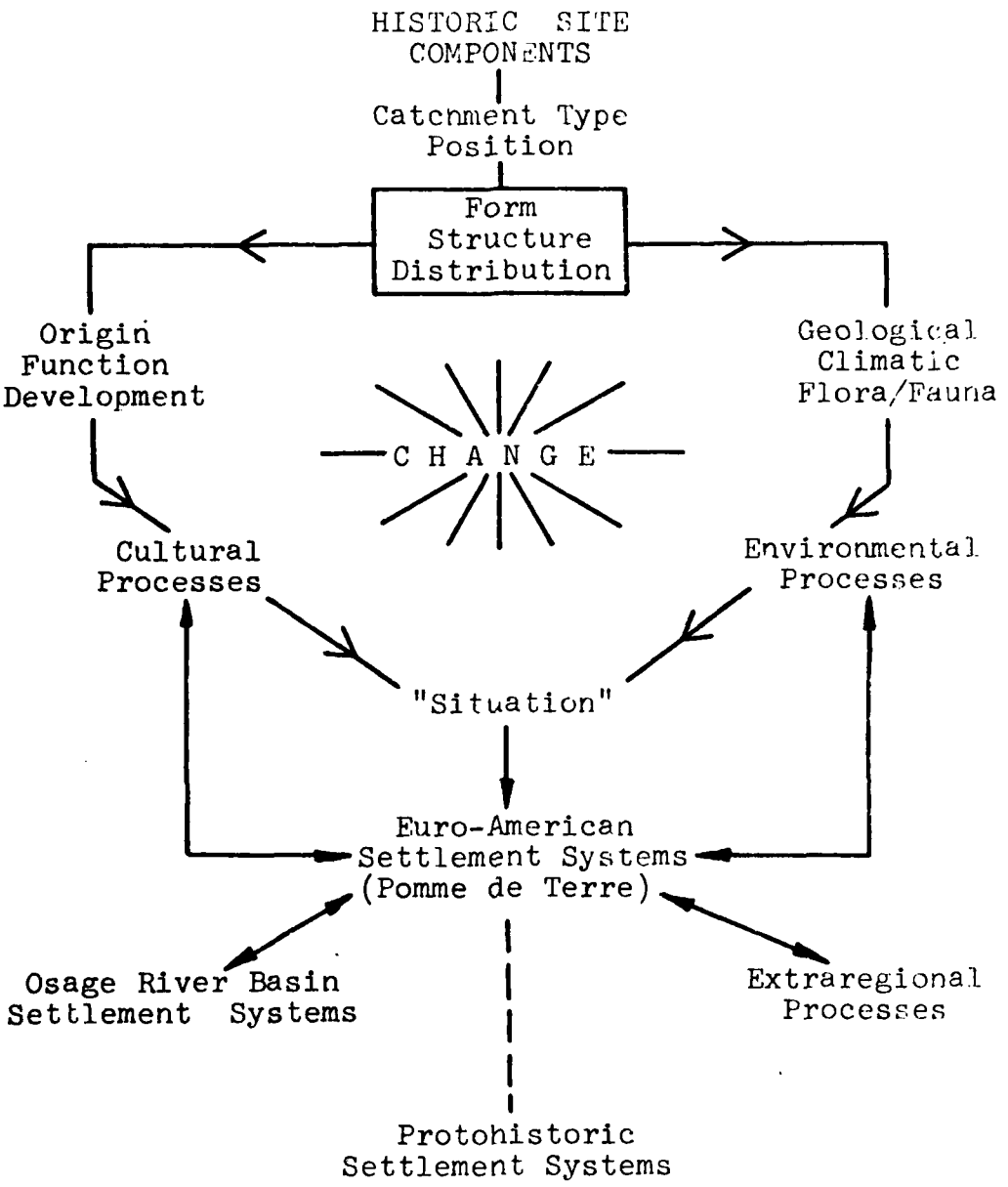


Figure 1. Research design flow chart.

CHAPTER II

APPROACH TO SETTLEMENT STUDIES

General

There is an expanding interest among archeologists, as anthropologists, concerning factors related to the manner in which people distribute themselves across the landscape. The studies which emanate from such interests are part of the total spatial archeological approach.

> Spatial archaeology deals ... with human activities at every scale, the traces and artefacts left by them, the physical infrastructure which accommodated them, the environments that they impinged upon, and the interaction between all these aspects (Clarke 1977: 9).

The emphasis on explaining these interactions is part of the general shift from the study of things to the study of the relationship between things.

Anthropologists, however, have not been the prime initiators of these approaches. For centuries the study of man's settlements has stimulated environmentalists and other scientists to examine factors of culture as it changed and how these changes are represented. Jones (1965: 14)

emphasized that the approach to geography should be made through man. Such ideas were expanded further by thoughts that geographers, as observers, should look upon the biophysical environment as a mechanism which offers numerous possibilities from which man could choose his own course of action (Jones 1965: 16). Thus, allowing him to be a decision-maker, though he inhabited a limited and partially restrictive situation.

The views of human geographers lead to an awareness that the concept of studying man's relationships and interactions with the physical environment would allow them to explain man's ability to adapt while, at the same time, enable them as researchers to examine the mechanisms or processes involved, which caused such adaptations.

Within settlement geography and archeology the analysis of these processes generally surrounds the investigation of position, form and structure and the distribution of human occupation with the associated natural and cultural environments. It is understood that spatial analytical studies represent an attempt to identify, describe and interpret regularities and variabilities (patterns) by additionally examining factors related to settlement origin, function, and development.

The concept of "site" and "situation," as defined by Eschman and Marcus (1972), must be taken into account when examining a settlement's <u>position</u>. A <u>site</u> is "the features of the local environment on which settlements are

established and over which they grow," while the *situation* refers "both to the physical conditions relative to the site that extend over a wider area than the actual settlement occupies and to man's cultural characteristics within and around the settlement" (1972: 28). A site, for example, may be represented by the rock overhang used as a shelter, the flora and fauna consumed as food as well as the resource materials exploited for freshwater, power production, fuel, fashioning of ceramics, lithics, shelter, means of transportation, etc. It encompasses the natural resource potential directly available to the individual inhabitants. The *situation* of the settlement is the total physical and cultural environments that in some way interrelate with the settlement. This could include total river drainages used for trade and communication, mountainous areas used for defense, hunting, building sites, and ridge road routes for transportation as well as other sociocultural groups.

Form or the manifestation of the position, supply the researcher with glimpses of cultural and/or environmental effects on the populations. Settlements may be found along bottomland streams or near springs in the uplands as separate units. They may represent single clusters at points within the physical environment as well as in patterned forms, such as on opposing banks of rivers.

A settlement's internal nature changes in *structure* through time. The economic, sociocultural nature may be directly related to particular feacures of the settlement;

such as: activity areas, building designs, individual ethnic and religious groups, economical and racial status, and regional-extraregional patterns of the total settlement under investigation.

Finally, the distribution of settlements may reflect both biophysical environment relationships and cultural differences depending on which physiographic zones the populations chose to exploit at a particular point in time during the development.

When totally examined, these manifestations of settlement furnish data to aid in recognition of patterns of regularity and variability which assist in developing models to explain the dynamics of cultural process.

Settlement Patterns

It is given then, that the manifestations just discussed are in part patterns of adaptation by populations to their natural environment. It is also evident that an ever present relationship of processes are at work which are interconnecting mechanisms within the spatial configurations.

These relationships have been expressed in the general terminology of settlement patterns and settlement systems. Settlement patterns are defined as:

> ...the geographic and physiographic relationships of a contemporaneous group of sites within a single culture.

while settlement systems:

> ...refer to the functional relationships among the sites contained within the settlement pattern (Winters 1969: 110).

This dichotomy has only recently been present in archeological settlement studies. The "settlement system" approach, which we will discuss in depth, was introduced during the 1960's under the "new" archeological banner (Binford 1962), which emphasized the need for scientific methodology in future archeology studies.

Patterns, on the other hand, have been implicit in most prior settlement approaches and finally specifically used by Gordon R. Willey (1953) in his study, Prehistoric Settlement Patterns in the Viru Valley, Peru. Willey (1953: 1) defines settlement patterns as:

> ...the way in which man disposed himself over the landscape on which he lived. It refers to the dwellings, to their arrangement, and to the nature and disposition of other buildings pertaining to community life.

He continues to describe the concept as a:

> ...strategic starting point for the functional interpretation of archeological cultures [that reflect] the natural environment, the level of technology on which the builders operated, and various institutions of social interaction and control with the culture maintained... (ibid.: 1).

Flannery, in his study, "The Early Mesoamerican Village," (1976) is even more specific when he defines the concept as:

> ...the pattern of sites on the regional landscape... derived by sampling or total survey, and is studied by counting sites, measuring their sizes and the distances between them and so on (1976: 162).

During the history of settlement study development there have been numerous additional attempts to analyze patterned relationships (see Parsons 1972 for a review). We will, however, abandon the discussion of this concept until future levels of our research.

Our first stage approach will focus on ethnohistorical evidence of "initial" Euro-American "ownership patents" and how they were related to a number of variables which are assumed to have had cultural significance. These same variables will be correlated with site-specific location data which will be gathered during the future stages of our investigation.

The three variables employed are: hydrography, topography, and vegetation. They will compare to Roper's (1977: 40-49) prehistoric site pattern description, but will also deal with factors related directly to historic sites.

HYDROGRAPHY

The variables which relate to settlement type locations include: (1) distance (horizontal) to water, (2)

distance (vertical) to water, (3) the rank of the stream along which the patent is located, (4) the side(s) of the drainage on which a patent is located, and (5) the relation of the patent to one or more major rivers in the area.

Horizontal distance was not only critical to assure an adequate supply of fresh water (Roper 1977: 10), but it also played an important part in the placement of historic docking areas, crossing points, general water travel and trade, as well as water power capabilities.

The vertical distance to water was not necessarily a concern for prehistoric populations but with historic sites we must account for such Euro-American features as sunken wells, cisterns and natural sink holes which supplied additional water resources from rainfall.

Stream ranking, outlined by Strahler (1964; see also Leopold 1974: 63-67; Weide and Weide 1973), will be examined by using the collected data by Roper (1977) to relate the size of the stream, its useful resources and level fluctuation to equate the potential exploitation that may have occurred.

The side or bank of the drainage on which a settlement is found needs to be considered because of the possibility of a patent encompassing both sides of a stream as well as more than one particular water source. Following Burghardt's (1959) study of historic Mississippi, Missouri and Ohio river towns, we will assume that settlements may

locate on the side(s) of the stream which afford them the best resource base.

Finally, the relation of the patent to one or more of the major rivers in the area has direct relationship to the above, and will be assumed to involve more of a resource potential than a settlement on the head waters of an upland stream.

TOPOGRAPHY

Three topographic variables are used to describe historic settlement types: (1) elevation above water ways, (2) exposure, and (3) their relation to uplands and bottomlands.

The multifactor involvement of selecting the placement of a settlement forces an examination of topographic variables as they are related to the characteristic of not only a settlement's site but also to evaluate the total situation, or "the area of land of various landforms found within a given distance from the site" (Roper 1977: 48).

It is assumed that the situation was evaluated by the potential landowner in regards to early subsistence productivity and future resource salability, resale value (especially if speculation was involved), access to general travel routes, trade travel, proximity of needed resources, size of population, climate, seasonality [known history of flooding, drought, and growing season] and expected length of occupation (Smailes 1966: 40-42).

Thus, situation and site data together with ethnohistoric evidence bring to light patterns of ownership placement which when combined with our overall approach will aid in understanding and explaining land use.

VEGETATION

Plant communities are considered one of the most important variables in this study due to their interactive function with other natural resources. With the evaluation of both ethnoarcheological data and the construction of the morphology of these ecological zones, we glean knowledge concerning not only the floral types present, but also assess potential past faunal communities that may have been exploited.

These data together with the understanding of the interaction between climatic factors and soil composition with the plant communities, will be used to describe the characteristics of both the <u>situation</u> and the <u>site</u> of each settlement type.

Before proceeding to the next section, it should be noted that the variables discussed in the above encompass additional resources which are factors in determining settlement patterns. However, due to their complex involvement, they will be discussed in detail as they are encountered within the total subsistence settlement system.

Settlement Systems

As anthropologists, we are continually involved with the factor of change. It is vital then, to study the mechanisms or processes of change concerning human population settlements in order to fully understand culture change.

To formulate a successful investigation of such change, we must assess what data can be studied in an objective manner and establish the limitations of that objectivity. The change must be documented and explanations must be presented as to how the transformation took place. The "how" being the ever present problem.

The most applicable approach to such problems is to model all the processes in action which affect a particular population at a given time and space. A model is a set of hypotheses that offer a putative explanatory framework for numerous observations (Clarke 1968: 32). In other words, models aid in the search for regularities and cultural sequences by fitting together successively more accurate concepts of reality into a developing (never ending) system (Schwartz 1977).

A system itself may be defined as "a set of parts which are coordinated to accomplish a set of goals" (Churchman 1968: 29), or a set of interrelated elements which function together as a whole. Clarke (1977) expresses its complexity when stating that:

> ...each element in the system can be considered itself to be a subsystem which contains a new set of elements...(1977:10).

Each of these subsystems are considered a "level" or level of abstraction, which incorporates its own internal functions with those external levels below and above. Since it is understood that none of the subsystems involved are continually stable, change in one element will influence all others. This chain reaction continues until the overall system has returned to a point of stabilization. With this in mind, we see why no element can be understood without investigating the co-elements functioning within its particular level as well as those within additional levels. Therefore, levels of abstraction or "resolution" are really "arbitrary horizons determined by the scale at which we wish to conflate related phenomena...and may be altered at will in particular studies by further subdivisions" (Clarke 1977: 14).

Employing both ethnohistorical and archeological techniques we will define a number of such levels or types of settlement structure. Each type will consist of its appropriate assumptions, theory and models. However, as these types are systemically interrelated, we may find that the problem, theory, model and methods of one type can answer for additional types if not the total system (Echenique 1971).

A settlement system constitutes a number of subsystems encompassing elements which are functioning within their particular settlement type; these elements are designated as additional subsystems as we subdivide the system further.

Range in dimension and magnitude of settlement types is, then, dependent upon the purpose of the typology. We view each type as representing:

> ...a particular configuration of exploitative and maintenance activities [which when] carried out will disclose a similar structure of...elements (Struever 1968: 135).

When viewed as being positioned along a functional continuum of complexity increasing over space and time, we anticipate our discussions to include an analysis of certain settlement types: activity areas, male and female work areas, house structure, household structure, home base cluster, kinship cluster, community, intercommunity, region, interregion and extraregion. Thus, we will deal with the most specific to the most general while at all times searching for explanations of what interrelated processes were functioning within the settlement system.

There is a point of commonality to this approach, however, since each settlement type is viewed (along the continuum) as consisting of specific but interrelated biophysical and cultural systems. For general purposes we refer to the latter system as simply involving man-man relationships, and the former as land-land relationships.

However, it is implicit that we keep in mind that the processes continuously functioning in a human settlement study, encompass man-land relationships.

The degree to which these two systems interact is related to the settlement type we are examining. For example, if we peruse a particular Euro-American frontier farmstead, we assume the inhabitants exploited their natural environment more extensively and directly than individuals interacting within a large city during the same period of time. Therefore, to explain the relationship of the cultural system to the resource system we first examine the "natural exchanges" or the exploitation of natural resources in which the settlements were "directly involved" (Rappaport 1969: 175).

In order to model the above, we use the basic assumptions of "site catchment analysis" (see Vita-Finzi and Higgs 1970; Higgs and Vita-Finzi 1972; Jarman, Vita-Finzi and Higgs 1972; Jarman 1972; Higgs 1975; Roper 1975, 1977 and Flannery 1976), as well as additional models developed which are directly related to Euro-American settlements (Schroeder 1968; Clendenen 1973; Waselkov 1976; Price and Price 1977).

Site catchment analysis was first introduced by Claudio Vita-Finzi and Eric Higgs (1970: 5) as applied to the Late Paleolithic and early Neolithic period of the Eastern Mediterranean. It was defined as "the study of the relationships between technology and those natural resources

lying within economic range of individual sites." The concept rests on the assumption that (other things being equal):

> ...the further the area is from the site, the less it is likely to be exploited, and the less rewarding is its exploitation since the energy consumed in movement to and from the site will tend to cancel out that derived from the resource. Beyond a certain distance the area is unlikely to be exploited from that site at all: in terms of the technology available at the time, its exploitation becomes uneconomic (Vita-Finzi and Higgs 1970: 7).

The catchment is understood to be the "total area from which the contents of a site have been derived" and the area "surrounding a site which is exploited habitually by the inhabitants" is designated the "territory" (Higgs 1975: ix). Thus the "specific site," "home range" (Vita-Finzi and Higgs 1970: 6) or "core" (Roper 1975: 14) is the center of the territory. From this fixed point, a series of broadly overlapping concentric zones are drawn. The circle which is furthest from the site represents the extent or catchment boundary to which the inhabitants of the site would have traveled to gather resources. The additional circles between the site and the outer limit are to account for the fact that walking time (rather than actual distance) is also a critical factor, and that catchment areas will vary according to the region and economy of the settlement. Each

section is then "weighted" according to distance from the site. Vita-Finzi and Higgs (1970: 29) derived this factor from Virri's (1946) studies in Finland which "illustrate how both net and gross yields per hectare decline with distance from the farmstead." The potential resource exploitation is then calculated within each zone, leading to inferences regarding the nature and function of each site.

The use of a circle to represent the catchment offers an interesting and reasonable method for comparing less complex prehistoric sites. However, as we encounter settlement types which have developed into more complicated systems, we find that additionally more "resource space" (Clarke 1977: 9) is being exploited in irregular directions and distances from the centerpoint due to a number of interrelated physical and cultural processes. It is assumed that these settlement types will be encompassed by a catchment, where all points of periphery are still theoretically accessible but the analytically imposed boundary is related not only to the most immediate resources but also to those resources exploited from settlements of the same functional type and/or those interacting above or below its level.

In our study, the size and shape of the catchment for particular types will be inferred through analysis of: natural and cultural material gathered by archeological methods at settlement type locations; a knowledge of the resources that were available for exploitation, as well as

documentation gleaned from ethnohistorical survey, discussions pertaining to the individuals inhabiting the area and descriptions of systems involved in the exploitation of particular catchments.

To go a step further in our reasoning and add depth to our approach to the overall study area, we have taken the liberty of designating a number of terms for "classification of catchments" in order to control anticipated data. The classes are: (1) immediate, (2) intermediate, (3) community, (4) intercommunity, (5) intraregional, and (6) extraregional catchments. As with most terminological structuring, these are incorporated for purposes of later analysis of the total settlement system. They are only mentioned at this point to alert the reader of their possible employment, and will be discussed in depth when appropriate.

Now that we have briefly discussed the means employed to describe the evidence of man's relationships with his natural resources, we must examine the processes within the total cultural system, or man-man relationships, which function to accomplish such exploitations.

Since individuals place themselves upon the geographical landscape in the form of settlement types, it is important to recognize that groups of individuals must be viewed as causal agents which continuously affect elements of the cultural system. Economic structure, political organization and religious dogma may also be considered

causal agents, but we chose the "individual" element for our focal point as it is the human being, functioning as a "decision-maker" within the sphere of the psychological subsystem, who directly participates and influences the cultural system through behavioral mechanisms. The system is viewed as

> ...an organized structure integrating amongst others, social, religious, linguistics, economic and material cultural subsystems [which] are the equilibrium networks within a particular cultural system, coupled one with another and with the external environing system (Clarke 1968: 83).

The system's technology is also implicitly visible in the techniques afforded by the individuals in motion as links with the external environing system. This system constitutes other sociocultural system within the same region as well as the natural resources (catchment) of the cultural system.

Therefore, a direct relationship will occur between the subsystem if a population's growth distribution or composition changes through time or space. When such changes occur, the initial response will be an attempt by the related processes to preserve the cultural system.

In terms of a total research area perspective, we will model the above separate but interrelated subsystems through a number of settlement phases: root, emigration,

immigration, pioneering merging, stabilization, fluctuation, decline and extension.

ROOT PHASE

To more fully understand settlement systems, we must gather data relating to origins (Sauer 1963; Clendenen 1973; Gerlach 1976) of the behavior patterns evidenced by the inhabitants of our particular settlements.

Past living systems or "root phases" will supply data pertaining to site and situation preference, level of technology, economic and political structure, ethnic and religious status, linguistic background, birth (nativity), age and sex, kinship ties, additional movement patterns (Lathrop 1949), and other processes operating within the cultural system. From these root data we may more efficiently explain the forces involved during the leaving (emigration) and the coming into (immigration) phases of these groups.

Emigration and immigration are generally discussed under the term migration; the moving from one place to another. We, however, have chosen to view them as separate but interactive phases, not only because it allows us to examine and explain the unique decision-making processes involved within each phase, but also because both terms specifically refer to human beings while migration denotes the movement of all living creatures.

EMIGRATION PHASE

At some point in time a segment or whole population may decide to move to a new location. This emigration phase is assumed to be the culmination of decisions which were stimulated by interactions between the population's cultural system and extraregional factors. The developmental changes arose in response to conditions which may no longer be apparent, or documented, and those essentially capricious. The assumption may be made, however, that it will be possible to recognize the variables affecting the root settlement's physical and cultural systems.

Within the physical system, changes in the climatic conditions may have stimulated movements of populations due to periods of flooding or drought. These factors together with natural and culturally induced soil erosion may have changed the emphasis inhabitants placed on their resource system. If time and effort utilization greatly surpasses resource exploitation, then a move to a more economically productive area would answer many problems.

Discussions concerning cultural systems as they affected settlement movements will be in general terms unless we are able to acknowledge specific documentation.

As these populations emigrated their root settlements, we will assume they immigrated to a prejudged location or began to search indiscriminately, for the sole purpose of alleviating the retrospective problems. Many individuals may have experienced numerous emigration-immigration phases

before finally settling an area that offered security and the life styles for which they searched.

IMMIGRATION PHASE

If it is assumed that many Euro-Americans immigrating to our study area experienced similar situations as stated above, we may expect that both decision-making and information-gathering processes, operating before and after their arrival, had a direct effect on the choices of settlement type location. Therefore, these locations were the result of a set of deliberate and rational decisions (Schroeder 1968: 23; Roper 1975: 11; Jochim 1976: 10, 16; Haselkov 1976: 16), made to meet a number of goals which were affected by the value system at that particular time.

The primary goals of any population are the procurement of sufficient food and non-food resources in close enough proximity to offer the individuals security and a minimization of effort. Thus, an accurate evaluation of their new resource system was dependent upon the immigrant's knowledge of climate, edaphic floral and fauna potentialities (Krause 1970: 110). We would expect then, that the first land claimed would have been the most desirable land and the last land claimed would have been the least desirable (Schroeder 1968: 3; Clendenen 1973). This would be the general pattern if all factors were constantly equal; however, this is not the case since there are many

processes that are involved which, as discussed earlier, affect such decisions.

Particular data are uncontrolled due to the lack of evidence pertaining to land choices. Though we employ land patent documents we still must: gather data pertaining to individuals who settled within the area before land was officially sold (squatters); account for reasons of resales; determine which individuals were practicing speculators who did not acquire property for the purpose of settling; ascertain whether an individual had the opportunity to view their claimed property first hand prior to purchase; and if such an opportunity were offered, were they knowledgeable enough of resource potential to make a satisfactory judgment in relation to their desires.

Finally, we will examine the extraregional forces which affected decisions made during the immigration phase. We expect, for example, that changes in the methods by which individuals acquired land due to governmental actions, together with national-world sociocultural situations (Schroeder 1968: 6) would have affected the rate of immigration and late emigration, the degree of land speculation and the marketability of the potential products of the settlement system.

With his studies of prehistoric pueblo society reconstruction and later demographic analytical work, Douglas W. Schwartz (1970, 1977) has employed a number of terms to designate "stages" of settlement development in

such a meaningful manner, that we have incorporated them into our Euro-American settlement study.

It should be pointed out that the apparent order in which we discuss the following phases has no bearing on their occurrence through time. For such evolutionary progression from primitive to advanced economies in which hunting is succeeded by sedentary cultivation and finally city related economy is both difficult to observe and is too simplistic for explanations of processes involved during settlement development. There is never a clear cut-off point between the end of one phase and the beginning of another nor is it assumed that only one phase may be occurring at any particular moment without other phases developing.

The general assumptions which continue through the discussion of the remaining post-immigration phases are: (1) settlements with less complicated economies will be simpler and have a closer relationship to the resource system which directly affects the settlement's adaptation; (2) as the economic complexity increases, and technological advances are realized, the settlement becomes more complex and an increasing control and manipulation of the natural environment occurs; and (3) as complexity continues, settlements develop into regional and extraregional systems interacting as complex cultural systems which require little from their natural environment in a survival perspective,

but which are exploiting the resources to a greater degree to further their complexity.

PIONEERING PHASE

During the initial few years following immigration all efforts are directed toward the individual's physical survival. The pioneering phase is one of self-sufficient subsistence patterns represented by hunting and gathering strategies as well as minimal crop growing to support the basic economic unit-family. These patterns are enforced by limited market capacities, lack of capital for investment and unsophisticated forms of transportation. In a technological perspective, tools are of a crude nature, hand made for the unspecialized agricultural practices.

Population growth is slow with the settlement pattern indicating a general dispersal of the immigrants. Crude shelters, constructed as simply and quickly as possible, surface as temporary steads until decisions are made to permanently occupy the land.

Group identifications, be they kinship ties, immigration companions or factors of ethnocentricity, form cohesive networks of companionship and promote communication with those who remained at the root settlements.

MERGING PHASE

The merging phase is denoted by the beginning of complex trade networks which stimulate settlements to grow

surplus crops and specialize in the use of their resources. Thus interrelated economic complexity compliments technological advances, which includes new industries moving to the area as well as the development of a sophisticated transportation system.

During this phase we see permanent shelters constructed, additional land acquired together with associated buildings being added to the stead, a swift increase in population growth with the possible beginnings of community type settlements. It follows then that the community will replace the family as the most important socioeconomic unit, and that social institutions will form.

We expect factionalism (due to population increase) to occur among individuals and certain groups relating to ethnic and economic status. The result may stimulate the structuring of a social class system or may bring about a complete separation of the group from its settlement, thus causing the group to emigrate to another area which places them in the extension phase.

STABILIZATION PHASE

It is understood from earlier discussions that cultural systems reach a point, after change processes have interacted, where a minimal amount of change occurs thus creating a balance between processes. The stabilization phase represents this point in the development of settlements. Therefore, it is assumed that when certain

changes occur, there are counter reactive changes (fluctuation phase) which bring the settlement system back into balance. It is also understood that if this did not occur, the system would enter the extension or decline phases which could lead to its demise. Thus the stabilization phase will be envisioned as a period of development which contains characteristics of many if not all the settlement phases, interacting as one settlement system.

During this phase, population growth will begin to stabilize due to lack of available land and pressure from earlier immigration. Settlements will function as regional and extraregional units within an ever increasing complex cultural system.

FLUCTUATION, EXTENSION AND DECLINE PHASE

These phases are really functional alternatives for the systemic development of settlements. Their characteristic patterns will be expected to appear at any point along the settlement phase continuum as the evidence of a population's interaction with its total cultural system.

In sum, this general discussion represents our approach to the multi-stage development of cultural-environmental models to be tested initially in the lower

Pomme de Terre River Valley. With these data we expect to support or refute our general theoretical propositions concerning the interactions between Euro-American subsistence-settlement systems and their natural environment. The general propositions are identical but somewhat adapted from those propositions used for hunting-and-gathering societies.

1. Euro-Americans settle within a non-uniform biophysical environment. Settlements represent a broad setting of resource availability and show graduations over space in relation to changes in the structure of the environment. Therefore, individuals who are differently located have differential access to resources.

2. Spatial boundaries of the property or individual ownership delineate the "catchment" types. The food and non-food resources to be exploited are within this area.

3. The decisions involved in choosing the catchment are made in a rational manner. Population distributions are not necessarily determined by the natural environment; rather, they represent adjustments to the factors by choice. Both cultural and biophysical environments must be taken into consideration to explain those decisions.

4. Certain individual catchments will eventually become grouped into a number of settlement types.

The implications from the above propositions are modeled as follows: First, individual ownerships will be determined from a survey of the Patent Claim Office Records. These data will be the basis for the total settlement pattern analysis. Secondly, vegetational zone data, gathered from the General Land Office Records (King 1977) will be used. Third, a computer mapping system will display the relationship between ownerships and the biophysical environment. Fourth, we will use a version of site-catchment analysis, whereas the catchment is inferred as the boundary of the individual ownership. Finally, data from ethnohistoric documentation will be evaluated for insight as to what processes were in force to affect the movement of the populations.

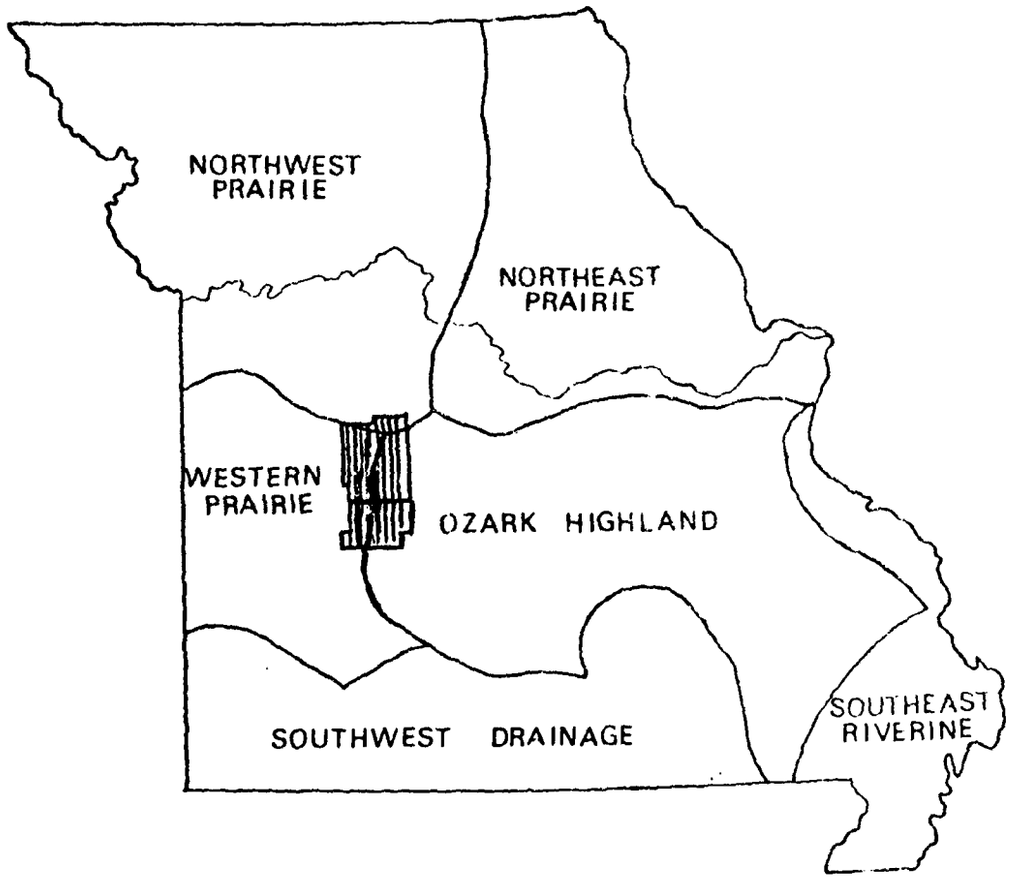
CHAPTER III

SURVEY

The following discussion results from an extensive survey of available documentation relating to our work. A number of major types of data were gleaned: first, the biophysical environment situation within the research area; second, initial location of individual Euro-American land purchases, and the land sale policies in affect during an 81 year period.

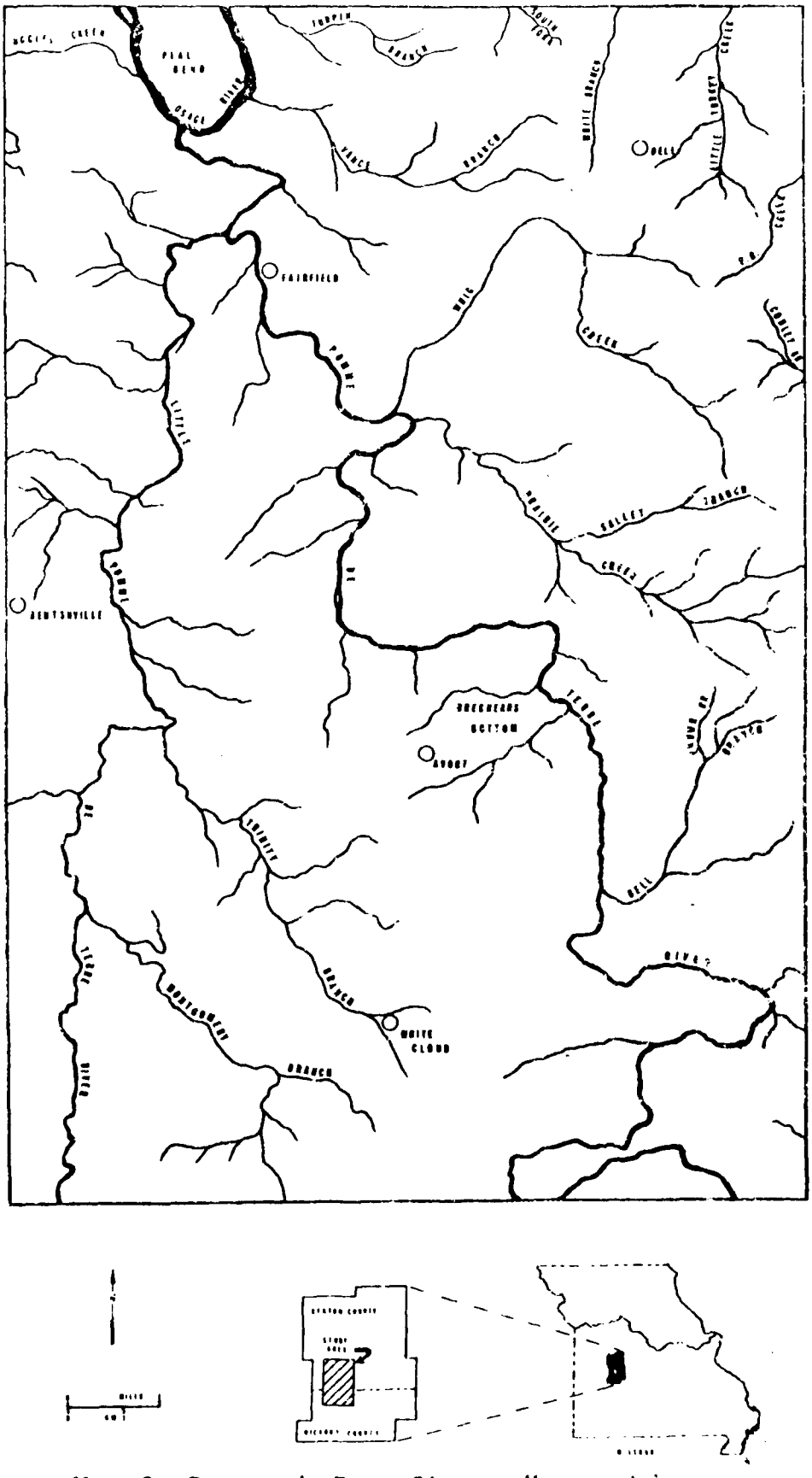
Study Area

For any study, it is necessary to first delineate the boundaries of the involved locality. Our region lies in the western portion of the Ozark Highland within the state of Missouri (Map 1), which is drained by the Pomme de Terre River. The drainage consists of small creeks which form 21.7 km (13.5 mi) of the Little Pomme de Terre and 36.2 km (22.5 mi) of the wider Pomme de Terre (Map 2). Both flow in a northerly direction with the Little Pomme de Terre joining the Pomme de Terre approximately 2.4 km (1.5 mi) above the latter's entrance to the Osage River, which is one of the larger local tributaries of the Missouri River.



(After Chapman 1975).

Map 1. Six Physiographic-Cultural Divisions of Missouri.



Map 2. Pomme de Terre River valley study area.

Boundaries have been defined by the arbitrary use of all Townships 38N and 39N, Range 22W; and the east half of Townships 38N and 39N, Range 23W. This 314.5 km^2 (121.5 mi^2) locality constitutes 87,000 acres of parts of Benton and Hickory counties.

Though our study area is somewhat larger than that used by Wood and McMillan (1976), the situation does not present us with any additional major biophysical factors. Since these factors have been treated extensively by McMillan (1976: 13-23) and King (1977), a synopsis of their discussions need not be presented here as it would only prove to be a reiteration of the subject. Therefore, we only need to discuss the nature of the vegetation zones within the area as these data are used extensively in our study.

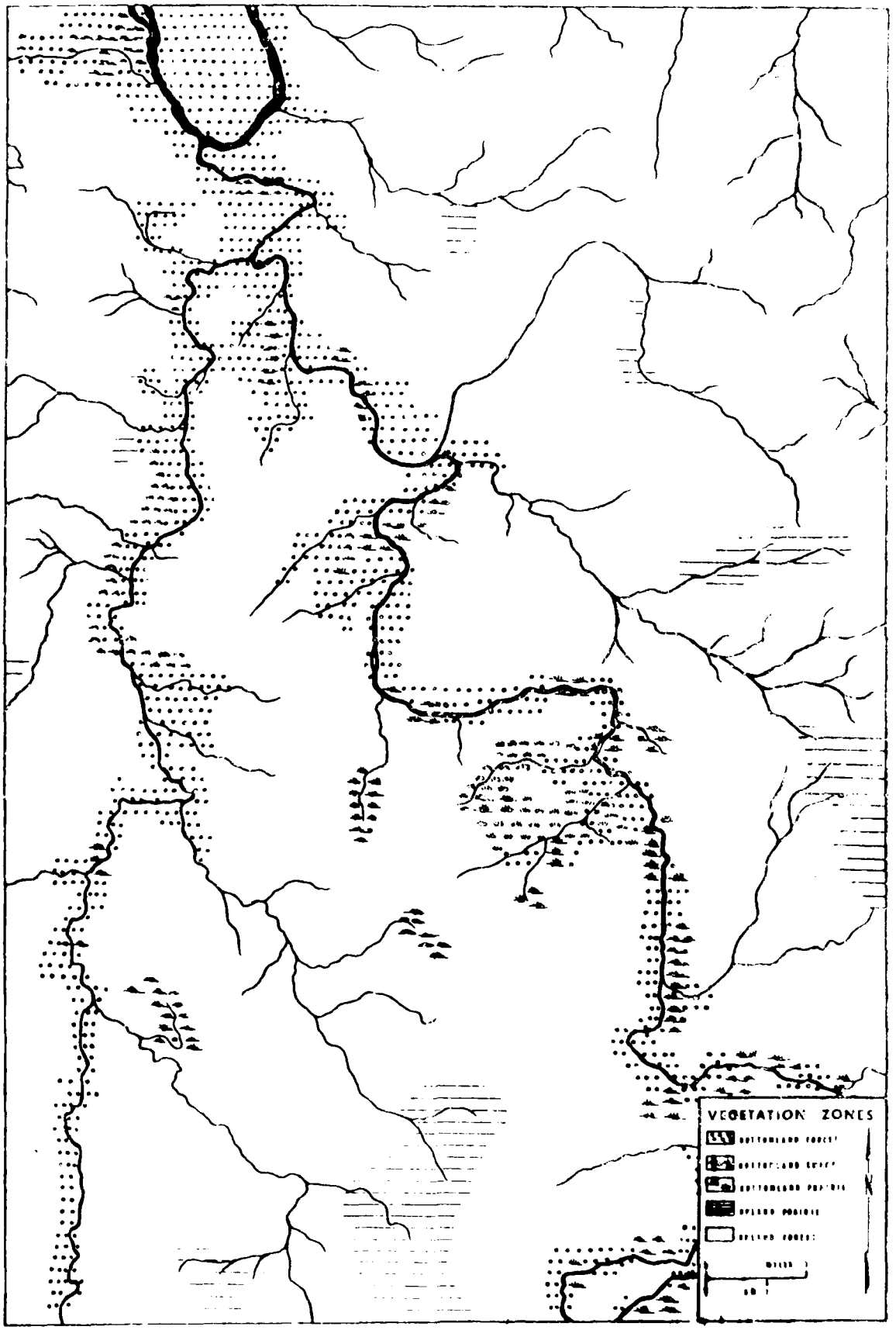
Vegetation Zones

The most important geographic consideration concerning the floral cover of the Ozark Plateau is the merging of the eastern deciduous forests with the tall grass prairies in a mosaic ecotone (Kuchler 1964: 82). From historical records it is possible to differentiate five plant communities in the study area (Table I): Upland Forest, Bottomland Forest, Upland Prairie, Bottomland Prairie, and Bottomland Swamp (Map 3).

Table 1

Vegetation Zones: Acreage and Percentage

Vegetation Zone	Acreage of Individual Vegetation Zones	Percentage of Total Land in Study Area
Upland Forest	70,550.60	81.05%
Bottomland Forest	9,552.66	10.98%
Upland Prairie	2,090.00	2.40%
Bottomland Prairie	1,035.12	1.19%
Bottomland Swamp	3,811.99	4.38%
Total	87,040.37	100.00%



Map 3. Vegetation zone distribution model.

UPLAND FOREST

McMillan (1976: 29-32) distinguishes between "Oak Barrens" and "Oak Hickory Forests." These barrens are referred to as hilly, primarily grassland with scattered trees and brush, while the oak-hickory areas are slightly more rugged. The land suveyor's notes suggest that the barrens were associated with post oak-black oak, small numbers of white oak, black jack oak and black hickory (ibid.: 29). The oak-hickory forest, however, was dominated by post oak, with white oak and black oak secondary. McMillan states that:

> Qualitatively, there is little difference between the composition of the oak-hickory forest and oak barrens... (ibid.: 31-32)

and:

> the oak-hickory forest (at the time of the settling of the Euro-Americans) was invading the grasslands... [with] areas described as barrens... [acting as] sections of the broad border between the Ozark forest and the Prairie Peninsula (ibid.: 34).

From these interpretations of McMillan it was decided that areas characterized by oak-barrens and oak-hickory terrain could be treated as one floral community, forming a combined zone which is referred to in our text as Upland Forest.

BOTTOMLAND FOREST

According to McMillan (1976:32), bottomland forest is the "most diversified" of any of the plant communities. It includes the "narrow zone paralleling the base of the bluffs, the floodplain proper, the riparian habitat bordering the streams, gravel bars, spring and slough borders and aquatic communities." Considered "as contiguous units," these zones contain "bur oak, black oak, chinkapin oak, hackberry, sycamore, black walnut, box elder, hickory, elm and maple" trees as well as small "bushes, vines and briers."

UPLAND PRAIRIE

The prairie communities extending into the study area are smooth, level zones containing such major grass species as "bluestem, Indian grass, Junegrass, dropseed, switchgrass, sloughgrass and sideoats grama" (Kucera 1961: 226). These upland prairies existed as patches in the upper reaches of creeks (Wood and McMillan 1976: 27) and in other areas within the upland forest zones.

BOTTOMLAND PRAIRIE

These prairies usually occur in abandoned meander loops on floodplains. The flora is difficult to define as the surveyors failed to specify species of such areas, but some of the vegetation listed by Kucera (1961: 226) were surely present during early settlement periods (McMillan

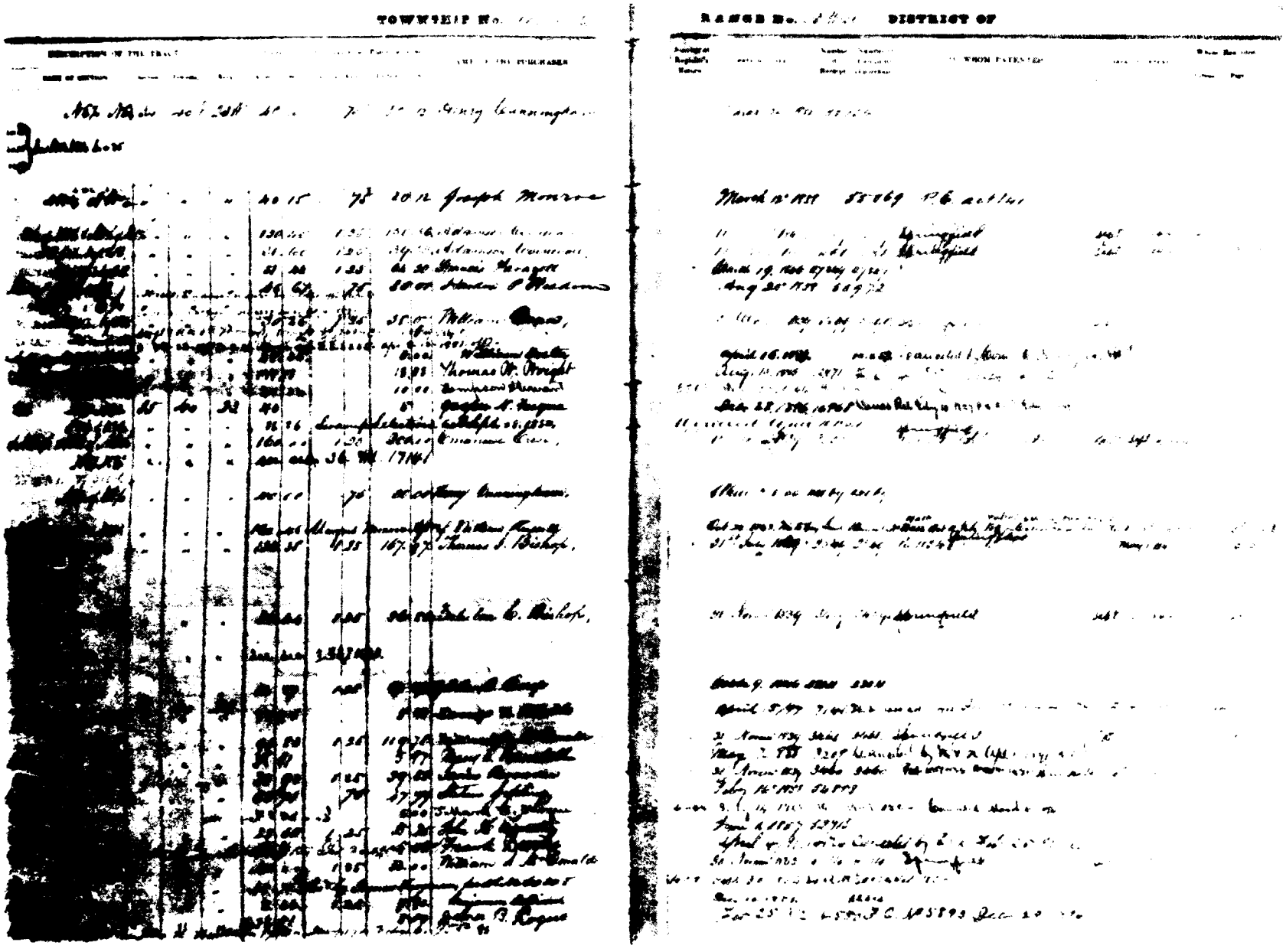
1976:27). These zones also tend to contain wet or bog areas where grasses reach the height of five to ten feet tall (Barnes 1879: 534). Such marshy areas are considered by us to be bottomland swamps.

BOTTOMLAND SWAMPS

Until our survey of the Land Office Records (L.O.R.) we had no indication of particular swamp zones other than those present within bottomland prairie areas which had occasion to be inundated by floods from nearby water sources. These areas were designated as "swamp selections" in the original sales books and were defined by the United States Government as overflowing, generally marshy and unfit for cultivation (L.O.R. 1867: 97). Floral species were once again not mentioned by the surveyors but we assume that they were similar to those discussed by Schroeder (1968: 4) which contained "rushes" as a permanent species as well as bottomland prairie communities.

Land Selection Survey

Microfilm of original United States General Land Office Records, obtained from the Bureau of Land Management, Washington, D.C., were the primary source for the information needed to begin our research. The procedure followed by the Land Office was to register each purchase in a claim book containing all the pertinent information concerning the land selected (Plate 1). We concentrated on



TOWNSHIP No.

RANGE No. DISTRICT OF

Plate 1. Example of a Land Office Claim Book page.

certain data: description of the tract, contents of the sale, the purchaser's name, and the date of purchase. Only those ownerships representing the initial purchases were entered on Form A (Figure 2) which has the same format as the claim book.

A second form representing the 64 possible ownership designations in a section was prepared (Figure 3). Each of the 64 divisions is approximately one 10-acre plot. Form B was designed to insure correct ownership placement and as an aid to later key-punching of the same data. Each ownership location was transferred from Form A to Form B. Also aiding in this process was continual reference to the original land survey plat maps (Figure 4) for indications of rivers, acreage, lot numbers and other pertinent information.

Several problems needed special attention to assure a controlled data collecting procedure. The most prevalent problems were illegible handwriting, cross-outs due to cancellations of ownerships and ink bleed-throughs from the opposite side of the pages. There were occasions when the location of the tract purchased was difficult to ascertain. Area designation was determined strictly by the original recorder. It may have been entered by its quarter-quarter designation as usual; by a lot number designation; or by a combination of these methods. As for those tracts sold more than once, only the initial purchase was included in our data.

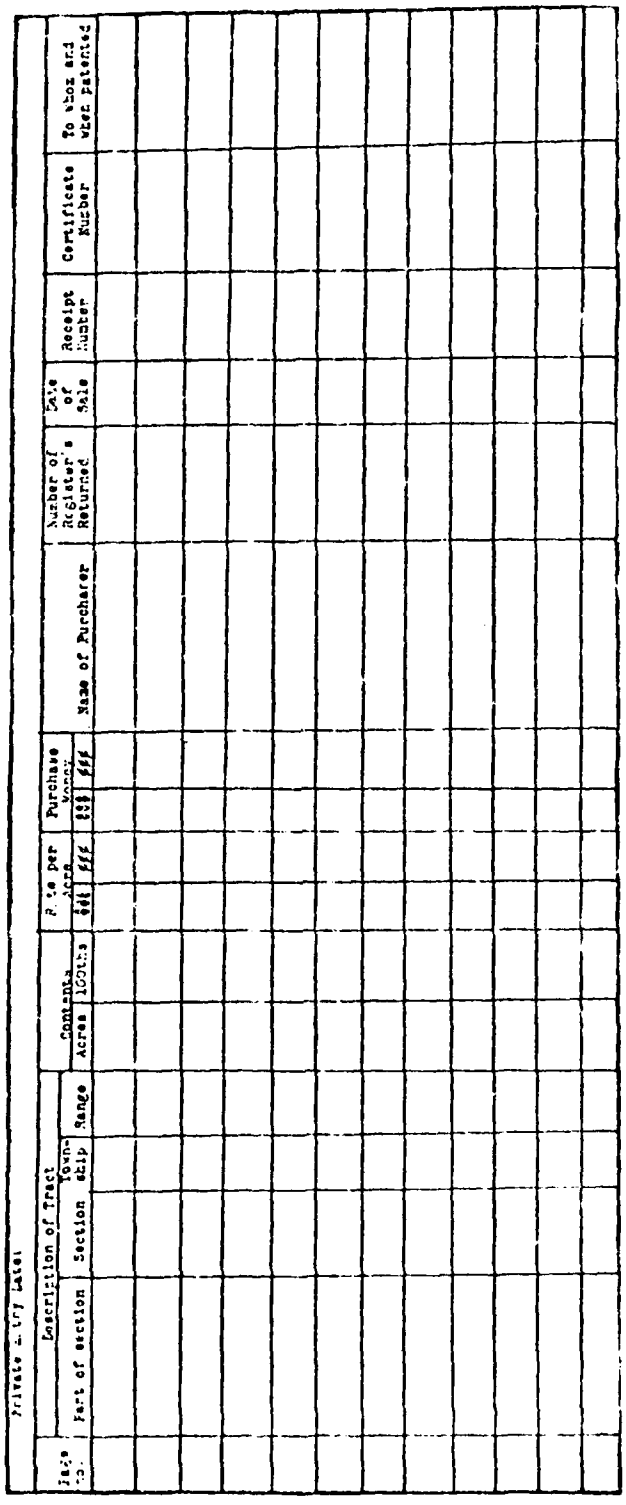


Figure 2. Form "A".

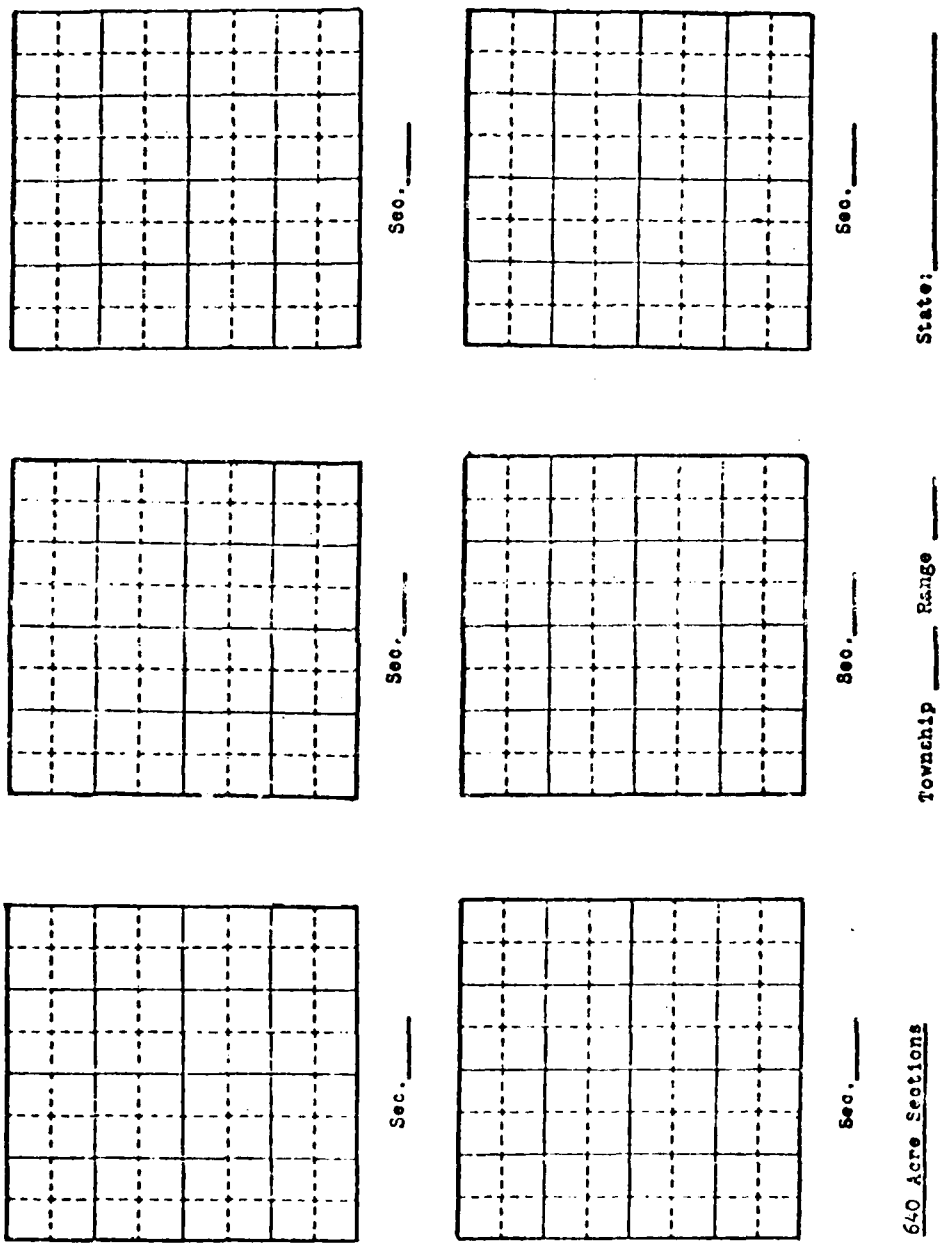


Figure 3. Form "B".

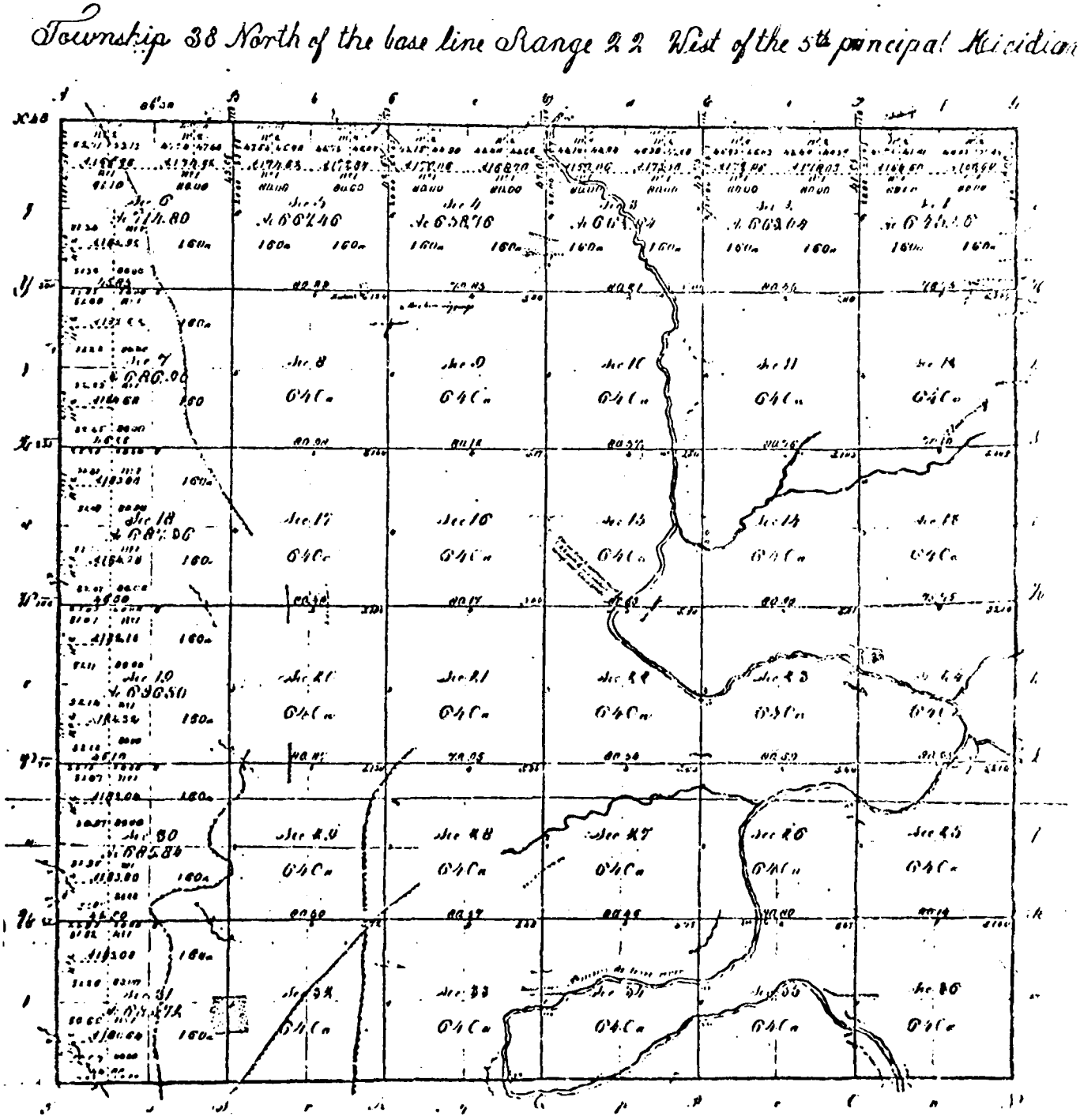


Figure 4. Land survey plat map.

Time Boundaries

It is clear that definite time boundaries must be set to control our study. It must encompass the magnitude and type of change which will show the most accurate and beneficial periodicity of events. To study change, we must view the system as if it were static, at a given point of time.

Since we are concerned with the initial selection of tracts of government land (not resale) in this first stage of research, we are involved with a total purchase period of 81 years; the first parcel of land bought in 1837 and the last plot in 1917 (L.O.R. 1837-1917). At present we have arbitrarily divided the overall period into nine ten-year subperiods and one eleven-year subperiod. Using the results of this first stage we will be able to subdivide the 81 years in a more precise manner relating to particualr cultural processes.

Euro-Americans and Land Sale Policies

The area now designated as the State of Missouri was strategically located in an extensive central continental river system. The earliest frontier travel was initially along the Ohio River. After the Louisiana Purchase was finalized in 1804, settlements were established along the Mississippi River, advancing up the Missouri River into present day western Missouri (Schroeder 1968: 8).

Great numbers of people began to pour into Missouri in the early 1820's, fostered by the admission of the area into the Union. Just as influential for this influx, however, was the Cash Sales Act of 1820 (Hibbard 1924: 101). This action reduced the minimum price of land to $1.25 per acre, allowed a minimum of 80-acre tracts (as many as desired) instead of the required 640, and freed the future purchaser from the problems of the "credit system" (ibid.: 82-88). Because of these changes, an individual could acquire 80 acres for $100 cash instead of the mandatory $400 for a tract of 640 acres.

Settlers moved into the interior of the state at such speed that by 1830 there were settlements along the western boundary of Missouri (Violette 1906: 51). At the same time flank movements on both sides of the Missouri River began (Garlach 1976: 25). These movements were aided by the major navigable Missouri River tributaries, such as the Osage River in our case, and its tributary, the Pomme de Terre River.

The composition of the settlers moving into the Pomme de Terre River valley was a matrix of many "old stock" Americans and individuals from central European countries, primarily Germany (Garlach 1976: 29). The Americans came from the states of Tennessee, Kentucky and North Carolina, with a makeup of Scotch-Irish, German, French and English extraction (West 1945: 5; White and Miles 1969: 3c). In general, these Americans possessed an eagerness and

fortitude which was intensified by an expectation of escape from constituted authority and earlier hardships of the actual settlement. The German movement was stimulated by Gotfried Duden (Spitz 1930), who described the northern Ozark hillsides as productive for horticulture, similar to southern Germany, but without the adverse social, political and economic conditions of "back home."

Because most of this area had not yet been surveyed, the surge of people presented land claim problems. The procedure carried out by the Public Land Office until 1862 was to first survey the land, proclaim the land for sale, and advertise it no less than three months nor more than six months before the date set for opening the sale (Hibbard 1924: 106). These lands were then put up for auction with the minimum price bid controlled by the minimum price per acre in force at the time.

If land had not been surveyed, the settler had two options. He could settle in another area that had been surveyed, or he could lay claim to land merely by staking it off. The latter was done within the study area until surveys were conducted and a Land Office opened in 1837 (White and Miles 1969: 14b). Choosing such an option however placed them in the eyes of the "Law" as "squatters" and thus trespassers (Hibbard 1924: 144).

There were extensive debates regarding these lawbreakers until the passing of the Preemption Acts of 1830, 1838, 1841, and 1853. The 1830 law, in force for only

one year, allowed the settler to purchase a quarter section if he had occupied and cultivated it during the preceding year, regardless of whether the land had been surveyed or not at the time of settlement. The 1838 Act was a reenactment of the 1830 law and lasted until 1841 (Hibbard 1924: 153-154). The 1841 law was a complete turnaround. The preemption only applied to those who were citizens of the United States-or aliens who had declared their intention of becoming such. It gave a person the right to settle on 160 acres at the minimum price providing the land had been surveyed at the time he arrived (Hibbard 1924: 158). This act excluded all those who were in unsurveyed areas and those foreign immigrants who were not initially concerned with becoming citizens. In 1853, however, the right of claim was given to those who had previously settled on unsurveyed land, which was a complete circle in the law (Hibbard 1924: 167).

Between 1830 and the early 1860s growth continued until every county in the Ozark Plateau surpassed a population density of two people per square mile (Bureau of Census 1860).

Two of the major factors influencing this growth were the Graduation Act of 1854 and the Homestead Act of 1862. The U.S. Government began to push for all public lands to be sold for the explicit purpose of taxation. However, sales were lagging in the late 1840s and early 1850s; thus the 1853 Graduation Act was passed (Hibbard 1924: 300). The law

reduced the price of an acre below $1.25 in proportion to the length of time it had been for sale without finding a purchaser. Thus, land that had been on the market for 10 years sold for $1.00 an acre, 15 years for $.75, 20 years for $.50, 25 years for $.25, and 30 years for 12-1/2¢ per acre. There were no limitations on how many acres one could purchase, thus opening it for speculators (Hibbard 1924: 301).

Passing of this law came at a time when there was prosperity and thus opened the possibility of purchasing large areas very cheaply. Many of the areas that had been for sale for many years consisted of the least desirable land, but now it was in demand. As a consequence, after the lands that could be bought below the $1.25 per acre disappeared, there was once again a general decrease in sales nationally (ibid.: 104). Also influencing this decrease was the holdout for expected "free" land in the near future.

This expectation did materialize with the passing of the Homestead Act of 1862 (ibid.: 383-385). A person could now acquire 160 acres, free of charge, if the land was lived on for five years prior to claiming. It is assumed that this law brought the greatest influx of settlers into the area. This was the last major law passed concerning the general ownership of land within the United States.

There is no question that these immigrants were obsessed with land, but they also conceived this new land as

wealth in the ordinary sense. While agreeing that the most powerful factors in the western expansion were "earth hunger" and the "desire for profit," Gabriel (1929: 5) admits that religious, utopian, escapist, and primitivistic motivations also played an important role. Along these same lines the preacher, journalist, and novelist, Timothy Flint understood the movement as a response to the myth of an Edenic Paradise:

> Very few, except the Germans, emigrate simply to find better and cheaper lands. The notion of new and more beautiful woods and streams, of a milder climate, deer, fish, fowl, ...and all those delightful images...that (we) associate with the idea of the wild... (Flint 1826: 241-242).

This strong insistence of the influence of myth moving these populations is only one side of the coin, for settlers of different backgrounds did not act in the same ways. A number of the earliest settlers were of a nomadic type:

> a kind of man who cannot settle upon the soil that they have cleared, and who under pretense of finding a better land...push forward, incline perpetually towards the distant points...and go and settle again (Michaux 1909: 192).

Other settlers were interested in material wealth. They purchased more land than they could use, with the idea of reselling it in the future at a profit. These settlers were not primarily "speculators," for they cultivated and fenced

parts of the land, while speculators usually never used their ownerships. There were those who proposed to found ethnic states or utopian communities such as "Germania," in order to hold on to their ways of life (Faust 1927: 441). Finally, there were ordinary settlers who purchased land in an area of their choice, making improvements to insure permanent ownership.

CHAPTER IV

ANALYSIS AND INTERPRETATION

Management of Data

The analysis and interpretation of the data was done by using two techniques: a computer mapping system and a form of site-catchment analysis.

COMPUTER MAPPING SYSTEM

Basic to the settlement analysis is the use of a computer mapping system (Howden and Miller n.d.). The system has the capacity to manipulate many bits of data in an expedient manner. These data are contained in a file made up of a number of fields, which is placed on tape (Figure 5). The fields are as follows: 6 characters represent the location within a section; 2 digits indicate the section; 2 digits represent township; 2 digits indicate range; price; name of purchaser; date purchased (year, month, day); two characters represent the vegetational zones; and the total acreage purchased.

The program is designed to take the total data file and screen it against any two inclusive dates. For example, we can examine all land purchased in the total study area

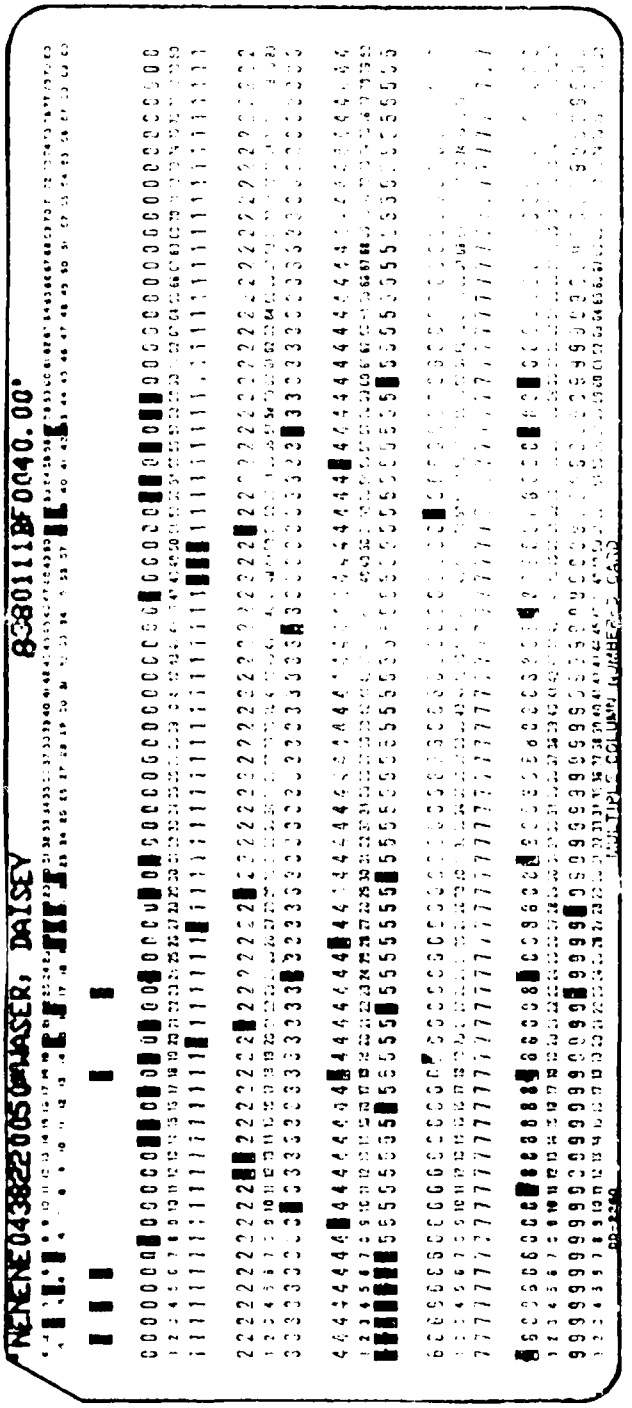


Figure 5. Computer card format.

between 8420104 (January 4, 1842) and 8800224 (February 24, 1880). This can also be done to ownerships in any particular township-range designation. These data are then printed out in two characters (last and first initials of the owner's name) in map form or in list form. The maps can then be combined with an overlay containing the vegetational environment of the area.

This system can print out the vegetational resource within the plot of land instead of the owner's initials. We can see the vegetational types present and gather statistical data at the time of mapping along with the listing of ownerships in the desired time period. These statistics, in graph and table form, enable the observer to see the settlement patterns represented by the map form.

With this system, we can print out any time period within our time boundaries, construct it in map form representing either ownership-initial form or vegetation, combine it with an overlay and have it available for analysis in a matter of three hours.

SITE-CATCHMENT

As Euro-Americans arrived in the area, there were processes affecting decisions regarding the choice of land. The resources found within each particular homestead or investment needed to provide for the economic survival of those who planned to inhabit the land or resell it for a profit.

An ownership is a parcel of land demarcated by informal or formal boundaries. Informal boundaries were mutual understandings between individual settlers. Formal boundaries were later established by law in the form of official surveys by the government. Our survey data are based strictly on formal boundaries. Unless individuals planned to claim land with kinfolk, they could not always use adjacent land. Therefore, the land within the formal boundaries of the ownership and its resources was the basis for the rational purchase and will be considered the "immediate catchment."

With the catchment representing the initial approximation of ownership and assuming knowledge of the major portion of resources in the area, we attempt to explain settlement patterns in a controlled manner.

It is assumed that as these immediate catchments are examined in regards to their economic resource base (vegetational zones evident), we will see the development of a catchment typology. Though we are involved with five specific zones, there is the possibility that combinations of these will be present within a single ownership.

General Research Questions

We will attempt to answer a number of questions within the framework of the first stage of our research. The initial group of questions was formulated to postulate the interrelationships that may be inferred from the Euro-

American settlement types and the related biophysical environment.

1. Did people select particular types of environmental situations?

2. How are these selections distributed in time and space? Is there evidence of a settlement pattern?

3. What evidence is there that certain cultural processes were creating a time/space movement among ownerships?

4. Is there evidence that these choices of land were made in a rational manner?

Settlement Periods

1837 - 1846

The official opening of the land office in Springfield, Missouri in 1837 did not stimulate a significant influx of land purchases in the study area. Only 33 individual land sale patents were bought, involving 2589.84 acres or 3.16% of the total available land. Sale records show five tracts were sold in February 1837, two in 1844, one in 1845 and the remaining 25 in 1846. Numerous factors may have influenced the rate of sale. First, the area had been populated by many individuals before the land was surveyed. Second, the survey was not conducted until 1840-45, with the majority in 1844-45. We may assume the earliest settlers could only purchase land under the rights

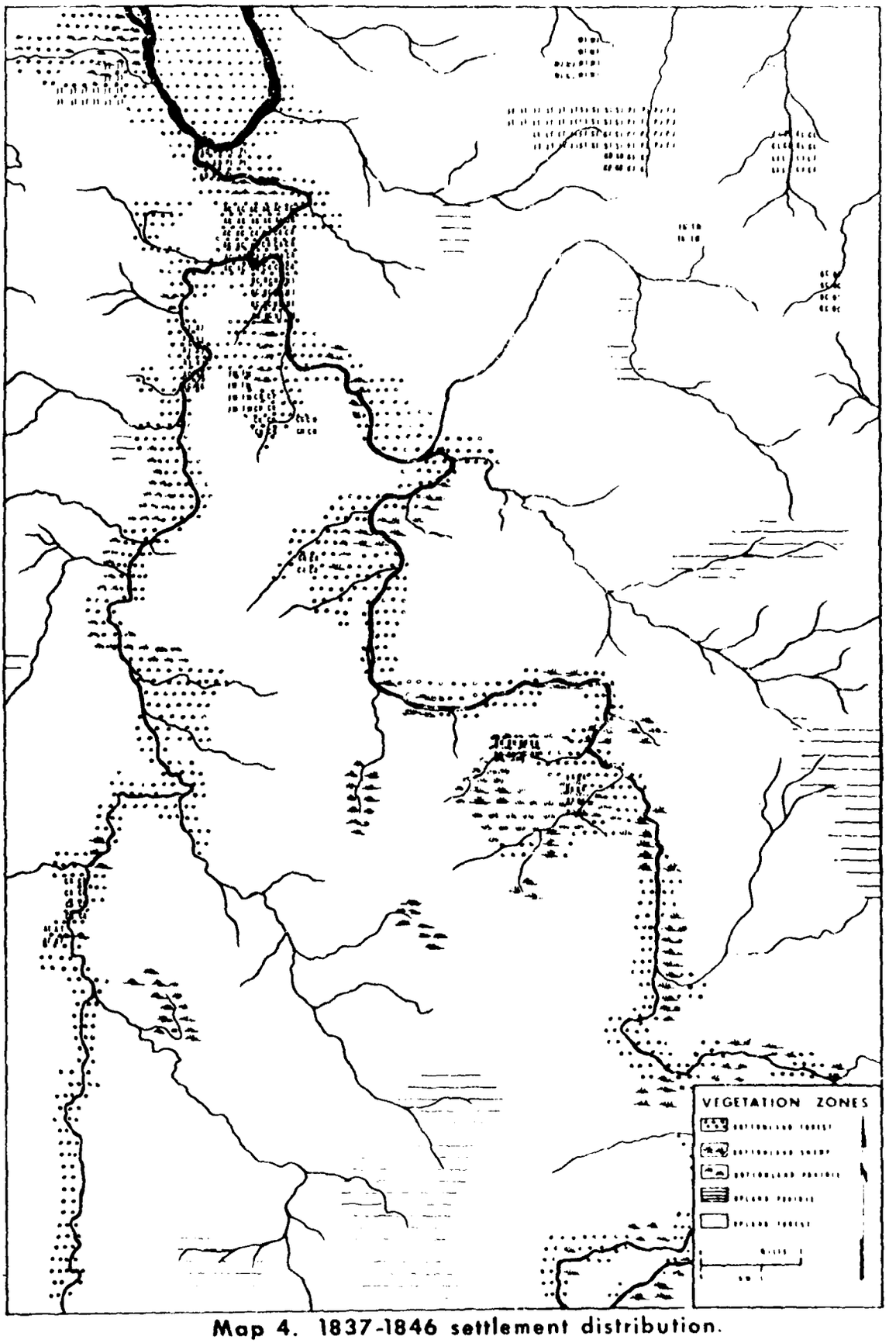
stated in the 1830 Preemption Act. The right to claim unsurveyed land ended in 1837, giving the settlers only two months to register "squatter" claims at the Springfield Office. The 1841 Act curtailed all such sales until 1853. We may infer the lack of sales and the purchase dates were related to the sequence of land surveys and the governmental policies in force at the time.

The initial settlement distribution (Map 4) indicates that land choices can be grouped into five ownership catchment types: bottomland forest (BF), bottomland forest-upland forest (BF-UF), bottomland forest-bottomland prairie (BF-BP), bottomland prairie (BP) and upland forest (UF) (Table 2).

Sales of seven tracts consisting entirely of BF were transacted during this period. The first three were located within a mile of the Pomme de Terre entrance to the Osage River. Later in the period, there is evidence of settlers making choices further up river, extending to the mouth of the Little Pomme de Terre.

Tom Blackwell (personal communication), a resident of the area, stated that BF settlement choices may have been influenced by the presence of water. It provided water transportation, fish, and close proximity to abundant drinking water.

Early settlers planted crops in the excellent alluvial soil (West 1945: 6) and used the abundant timber supply to construct buildings on the floodplains (ibid.: 7; Schroeder



Map 4. 1837-1846 settlement distribution.

Table 2

1837-1846 Catchments: Acreage, Sales and Percentage

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest	602.78	23.27%	7	21.20%
Bottomland Forest - Upland Forest	688.50	26.58%	9	27.30%
Bottomland Forest - Bottomland Prairie	80.00	3.09%	1	3.03%
Bottomland Prairie	90.06	3.48%	1	3.03%
Upland Forest	1,128.50	43.58%	15	45.44%
Total	2,589.84	100.00%	33	100.00%

1968: 5). Each of the patents may have been fringed by bottomland swamp. This would have enabled the owner to farm additional land and graze cattle during drier periods. However, these areas were probably malarial (ibid.: 6) and flooded both fields and buildings numerous times.

Patents containing BF-UF combinations were along the banks of rivers and creeks. The first evidence of western movement is seen with a single purchase in 1837 on the south bank of Hogle's Creek. Other owners chose land on the banks of the Pomme de Terre, its feeder streams (1846) and along the Little Pomme de Terre (1846). Five patents (1844-45), ten miles up the Little Pomme de Terre, may have resulted from the 1840-41 survey of this township. This type of catchment offered greater resource variety. The owner had water and fertile soil for farming and possible swamp area for cattle grazing, but could now avoid the malarial wet areas by constructing buildings on the upland forest hill areas thus providing more of a permanent habitation.

In 1846 two patents were chosen along feeder streams about 17.7 km (11 mi) up the Pomme de Terre, in an area now known as the Breshears Bottom. One catchment contained both bottomland forest and bottomland prairie, while the other consisted entirely of bottomland prairie. Both offered easy access to water and excellent grazing land for cattle and swine. The BF-BP combination had rich soil for farming and the possible use of bottomland swamp.

Purchases consisting entirely of upland forest were settled in the northeast portion of the study area on the upper extremes of small creeks 5-8 km (4-5 miles) from any river. These purchases were possibly influenced by the type of settler and the manner in which they arrived in the area. The early settlers moved up the Osage River and its tributaries as they proceeded west, moving up the small branches as they were discovered. If they found the land unfavorable, they returned to the Osage and continued upstream in search of more desirable land. These individuals may have been originally from secluded steep sloping forest areas, thus making it logical for them to choose similar habitats.

Such small secluded homesteads were reported by West (1945: 7, 115). They used a crude form of "patch" farming on the thin rocky soil and grazed cattle on poor pastures. The individual owner had an abundance of timber for building materials and fuel, a large variety of flora and fauna, and abundant spring water.

Examining each catchment individually (Figure 6) we discover the majority of sales and acres are upland forest catchment choices, followed in order by BP-UF, BF, BF-BP and BP. However, if we combine the ownerships containing any lowland catchments and compare them to the sales of upland forest, the result is a preference for lowland catchments.

In sum, during this period individuals were primarily choosing land that contained floral resources native to the

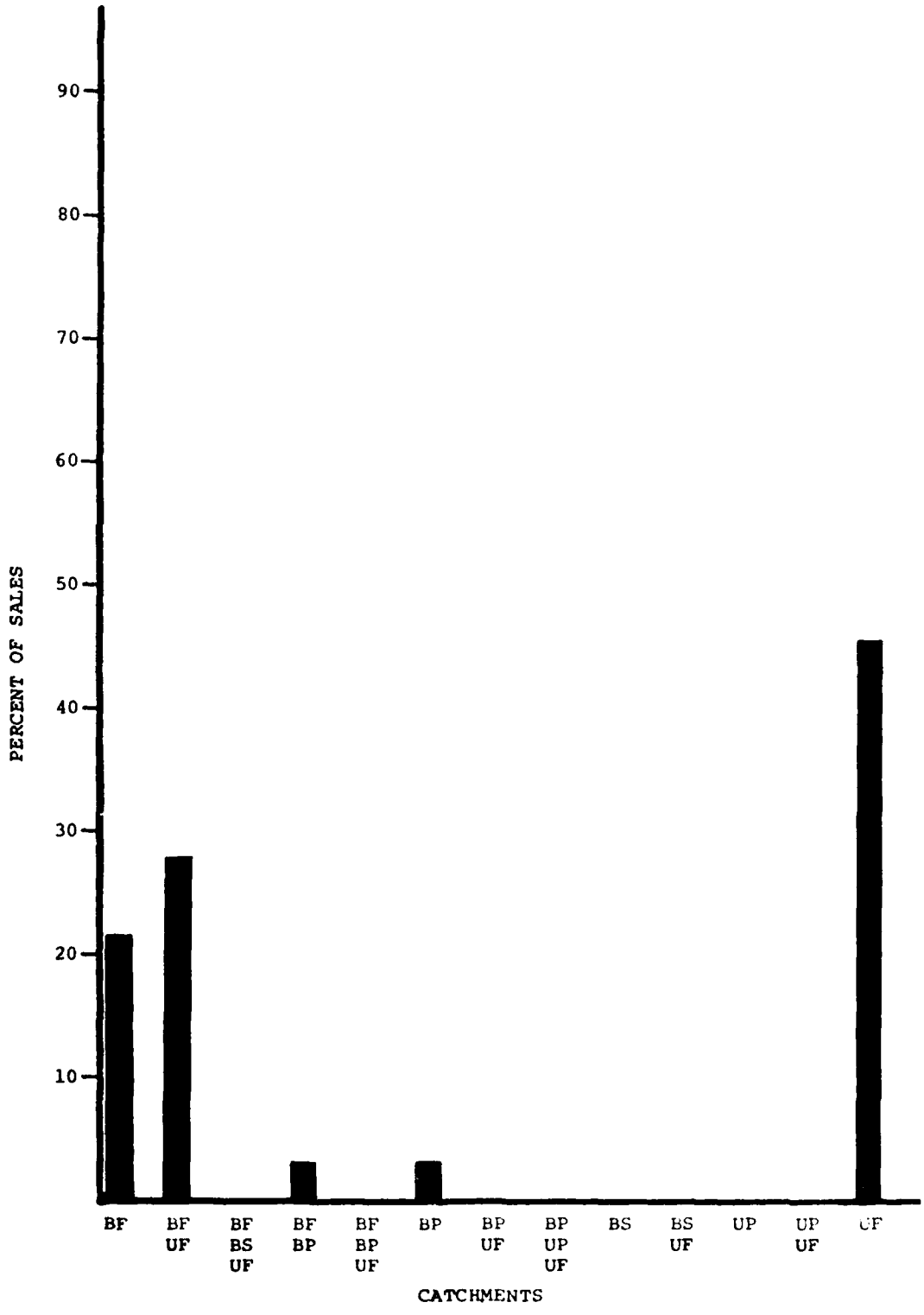


Figure 6. 1837-1846 catchment choices.

banks of large rivers and their immediate feeder streams. Second in choice were upland forest catchments purchased by settlers accustomed to such areas. Finally, all land purchased in this period was within 3/4 of a mile of water, thus indicating the importance of naturally flowing water as a major resource.

1847 - 1856

Land purchases from 1847-56 totaled 14,072.82 acres or 266 individual sales. A definite sales pattern was established. During the first four years there was a steady drop in sales. The decline was a result of the 1841 Preemption Action which restricted the land "squatters" could purchase. Severe climatic conditions in 1850 affected this decline. The next two years showed a moderate increase in general purchasing. This increase leveled off in 1853 with 63 sales, representing more purchases in that year than in any other year in the period. This is related to the passing of the Preemption Act of 1853, which allowed individuals who had originally settled on unsurveyed land to now officially claim it. An additional factor related to this increase was the opening of a land office in Clinton, Missouri which was nearer the settlements.

Only 23 tracts of land were sold in 1854. This drop in sales was followed by a steady increase during the next two years. This was the beginning of a continuous upsurge in sales due to the 1854 Graduation Act. Most land which

had been officially for sale for ten to 15 years could now be purchased for $.75 to $1.00 per acre respectively. Undesirable land was now in demand.

The sales during this period represent twelve catchment type choices: BF, BP-UF, BF-BP-UF, BF-BP, BP, BP-UF, BP-UP-UF, BS, BS-UF, UP, UP-UF and UF (Table 3).

The majority (43) of the bottomland forest tracts were bought during the first seven years. These purchases included all of Peal Bend, parts of the banks of Hogle's Creek, and many areas along the banks of both the Little Pomme de Terre and the Pomme de Terre rivers and their feeder streams. These purchases showed a general closing in of the bottomland area along both rivers.

Land sales representing bottomland forest-upland forest catchments took place throughout the entire period. Twenty-three of them were on the banks of the Pomme de Terre, 15 were on the Little Pomme de Terre and the remaining tract was on Hogle's Creek.

Besides Breshear's Bottom, there were three other bottomland prairies in the study area. One extended two miles along the west side of the Little Pomme de Terre, a second 20 acres was on Hogle's Creek, and the third 50 acre prairie was on the west side of the Pomme de Terre. Thirty-five tracts of land involving some portion of bottomland prairie were sold during this period. Three types (BF-BP-UF, BP-UP-UF, and BP-UF) not previously mentioned need to be discussed.

Table 3

1847-1856 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest	2,183.68	15.52%	43	16.17%
Bottomland Forest - Upland Forest	1,967.00	13.98%	39	14.66%
Bottomland Forest - Bottomland Prairie	812.70	5.77%	17	6.39%
Bottomland Forest - Bottomland Prairie - Upland Forest	200.00	1.42%	2	.75%
Bottomland Prairie	160.00	1.14%	3	1.13%
Bottomland Prairie - Upland Forest	569.21	4.04%	12	4.51%
Bottomland Prairie - Upland Prairie - Upland Forest	40.00	.28%	1	.38%
Bottomland Swamp	240.00	1.71%	6	2.26%
Bottomland Swamp - Upland Forest	80.00	.57%	1	.38%
Upland Prairie	800.00	5.68%	14	5.26%
Upland Prairie - Upland Forest	800.00	5.68%	10	3.76%
Upland Forest	6,220.23	44.21%	118	44.35%
Total	14,072.82	100.00%	266	100.00%

Selections of land containing BP-BP-UF and BP-UP-UF offered a unique resource potential; the bottomland forest offered rich soil to raise crops, the upland prairie and bottomland prairie supplied grass for grazing livestock, and the upland forest enabled the owner to build a home on the upper slopes near his fields and water but above flood level. The BP-UF catchment, though not as beneficial, was in demand for its bottomland grazing possibilities.

Individual tracts of land designated as "swamp selections" were purchased between 1850-55: six of them were entirely bottomland swamp while one contained some upland forest. All purchases were on the banks of the Little Pomme de Terre and the Pomme de Terre rivers. This catchment offered grazing areas and additional land for farming during dry periods.

Purchasing of catchments containing UP and UP-UF marked the beginning of upland prairie settlement. Except for BP-UP-UF (previously discussed), all sales containing upland prairie were bought between 1853-1856. These 24 catchment areas, often without enough water (Thwaites 1905: 214) and long considered unfit for cultivation (Violette 1906: 48), were potential pasture lands for farm animals.

Upland forest catchments were once again scattered along the banks of streams and creeks. Individuals were attempting to buy every available acre along these upland waterways before occupying the upland prairie areas.

In sum, the majority (54%) of the catchment purchases involved the upland forest patents (Figure 7). Most sales were made in the latter part of the period when the price of such land was cheaper.

BF and BF-UF ranked second and third (46%) in choice but were bought earlier than upland forest or upland prairie areas.

At the end of the second period, vegetation figures indicate 47% of bottomland forest acreage remained, while only 6% of bottomland prairie and 47% of bottomland swamp were still purchasable. However, 62% of upland prairie and 85% of upland forest areas still were unclaimed.

A definite pattern of locating along the banks of streams, creeks, feeder streams and rivers was established. Purchases now extended 17.7 km (11 mi) up the Little Pomme de Terre and 30.6 km (19 mi) up the Pomme de Terre. Every major branch and stream had some settlement on its banks and many were completely settled.

This period marked the initial purchase and use of upland prairie and bottomland swamp vegetation zones, which generally were considered undesirable.

We see the first residents of the future communities of Dell (established 1876), Fairfield (established 1853), Bentonville (established 1891), Avery (established 1890) and White Cloud.

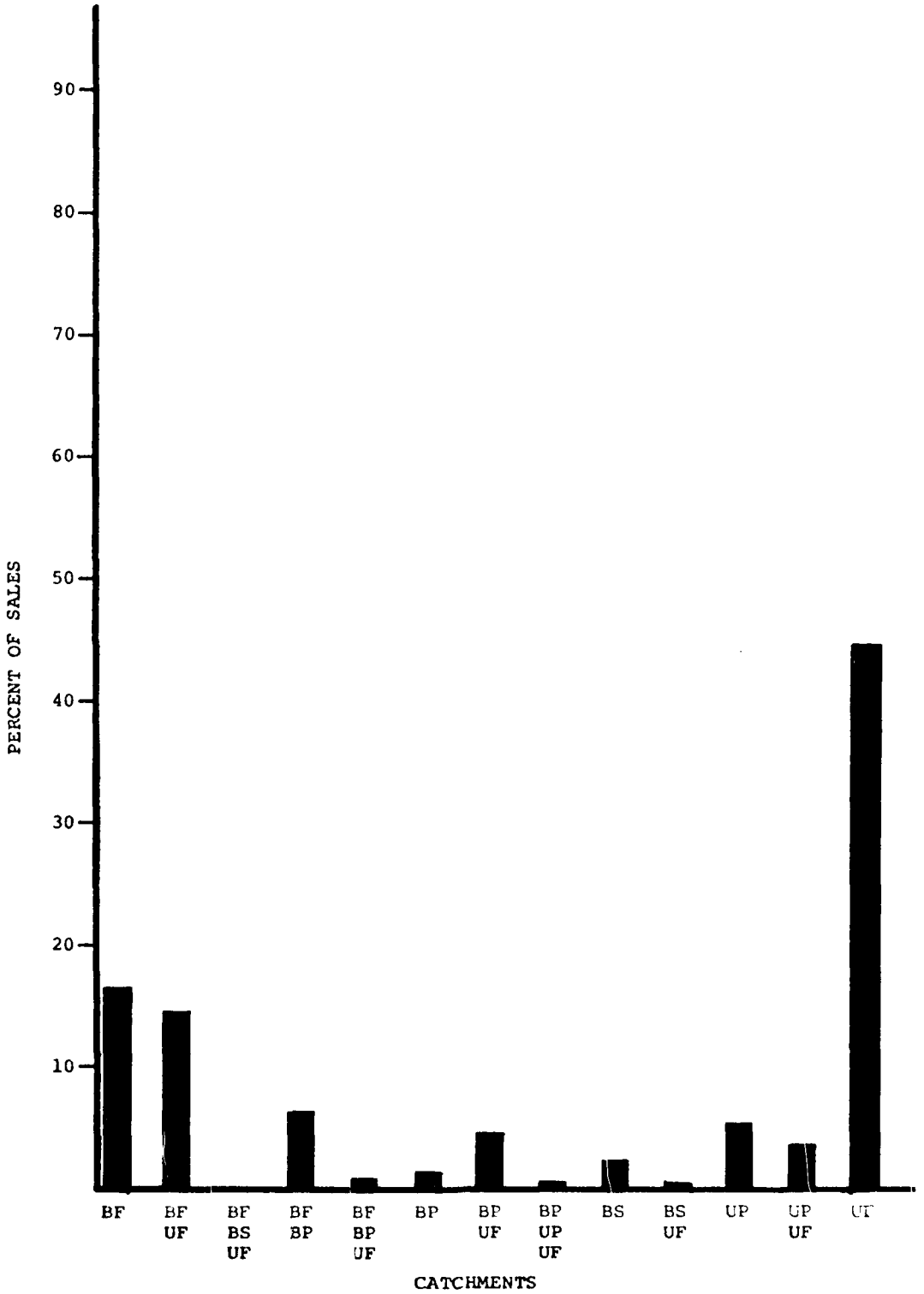


Figure 7. 1847-1856 catchment choices.

1857 - 1866

Sales during this period showed a sharp increase, with almost 80% of them transacted in the first half of the period. This increase continued as a result of the 1854 Graduation Act. Individuals were purchasing land for 50¢ to 75¢ an acre, which was even cheaper than it had been just a few years prior. The claimed land consisted of areas that were still desirable for cultivation but less desirable if the cost had been higher.

In 1862 free land was made available by passage of the Homestead Act. It allowed those who had lived on land for a period of five years to now claim it. This should have created an increase, but in fact the opposite occurred in the study area. There were only 91 tracts of land claimed after the act was passed, with 72 claimed in 1862-63, and the remainder in 1866. This decrease was related to two factors: those now having the right to free land had generally purchased their homesteads by 1863, and the general upheaval caused by the Civil War.

The catchment types (Table 4) represented in the 412 choices were: BF, BF-UF, BF-BP, BF-BP-UF, BF-BS-UF, BS, BS-UF, BP-UF, UP, UP-UF, and UF.

Both bottomland forest and bottomland forest-upland forest catchments were purchased during the first seven years. The areas chosen were at the mouths of Hogle's Creek and Vance Branch of the Osage River, Trinity and Montgomery

Table 4

1857-1866 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest	753.71	3.34%	17	4.13%
Bottomland Forest - Upland Forest	3,453.88	15.31%	54	13.11%
Bottomland Forest - Bottomland Swamp - Upland Forest	80.00	.35%	1	.24%
Bottomland Forest - Bottomland Prairie	80.00	.35%	1	.24%
Bottomland Forest - Bottomland Prairie - Upland Forest	80.00	.35%	1	.24%
Bottomland Prairie - Upland Forest	200.00	.89%	3	.73%
Bottomland Swamp	40.00	.18%	1	.24%
Bottomland Swamp - Upland Forest	80.00	.35%	1	.24%
Upland Prairie	840.00	3.72%	15	3.64%
Upland Prairie - Upland Forest	1,200.00	5.32%	18	4.37%
Upland Forest	15,762.11	69.84%	300	72.82%
Total	22,569.70	100.00%	412	100.00%

branches of the Little Pomme de Terre, along the banks of both the Pomme de Terre and the Little Pomme de Terre, and along minor feeder streams of both rivers.

Three additional parcels containing some portion of bottomland forest were also bought. Their catchment and locations were: BF-BP in Breshears Bottom, BF-BP-UF three miles up the Little Pomme de Terre, and BF-BS-UF six miles up the Pomme de Terre River. This latter catchment was possibly chosen for its rich farming soil, its swamp area for additional land, and its upland area for building the homestead.

Both bottomland swamp areas bought in 1862 were on the Pomme de Terre River.

The last of the bottomland prairie in our study area was sold in this period. All three purchases were combinations of BP-UF catchments. One was on a small feeder stream of the Little Pomme de Terre while the others were on feeder streams in Breshears Bottom.

The 15 upland prairie and 18 upland prairie-upland forest catchments were bought in the first seven years of the period. They represented choices on Vance Branch, Whig Creek, Salley Branch of Prairie Creek, the upper extremes of Bell Branch of the Pomme de Terre, and the upper extremes of Trinity and Montgomery branches.

In sum, most purchases involved catchments containing all upland forest (Figure 8). They were bought between 1857-63 and in 1866. Areas along every stream and creek as

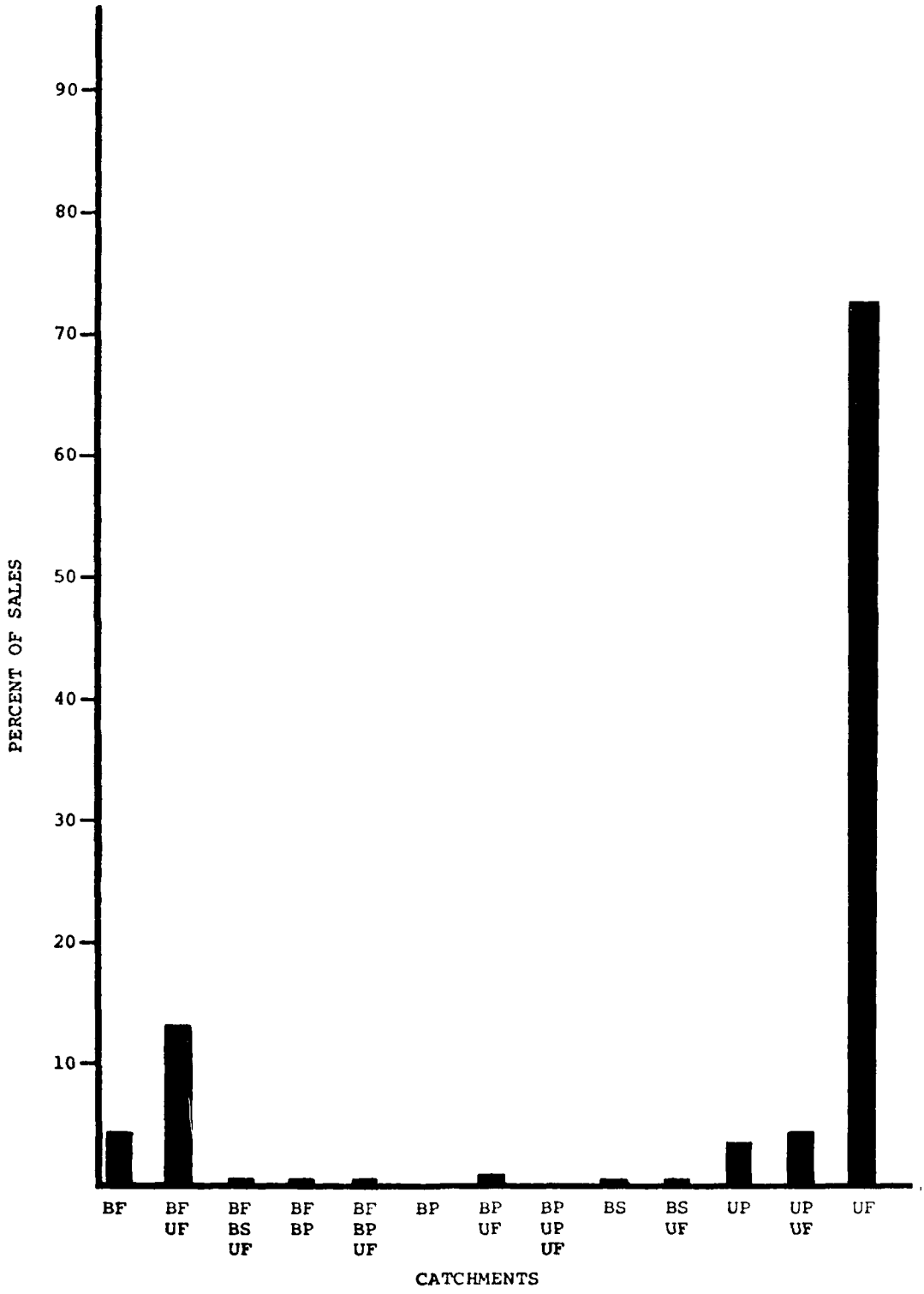


Figure 8. 1857-1866 catchment choices.

well as in between were chosen. The increase in catchments represented individuals taking advantage of the cheap or free land.

The settlement pattern indicates a general closing in of the bottomland areas, and then an increased movement to the interior.

All catchments containing some portion of bottomland were purchased during the first seven years, with most of them registered 1857-60. The purchases of this period involved a tremendous amount of desirable land. All available bottomland prairie had been chosen; only 180 acres of upland prairie and 2205.52 acres of bottomland forest remained available.

All land consisting of upland forest, except for banks along Vance Branch, Whig Creek, Bell, Trinity and Montgomery branches, is assumed to have been the least desirable land.

1867 - 1876

The 134 sales in this period were all transacted in the first three years, with the majority of it purchased the first year. This decline and later total lack of sales in the last seven years could have been related to the severe drought beginning in 1869. However, it appears that a major factor may have been a general movement through the area by individuals searching for desirable land. Finding little of it still available they continued westward.

Land purchases were possibly made to increase an established resource base or by speculators hoping to control the ownership of the least desirable land in order to later resell at a profit when no other land was available. Most of this land could have been settled earlier, but the individuals waited the five years in order to acquire it free under the Homestead Act.

The areas (Table 5) claimed consisted of BF, BF-UF, BS, BS-UF, UP, UP-UF and UF catchment types.

The bottomland areas were on the banks of both the Pomme de Terre and the Little Pomme de Terre rivers.

The four upland prairie choices were settled on Little Turkey Creek and on the upper reaches of Prairie Creek and Trinity Branch.

The upland forest catchments generally closed in most of the vacant areas along streams and creeks, with 63 of 102 purchases having been sold by 1868.

By the end of the period only 1154.18 acres of bottomland forest and 120 acres of upland prairie remained. The rest of the available land consisted entirely of upland forest.

Figures indicate choices of BF-UF (15%) and UF (76%) were the major choices during the period (Figure 9). Other catchment sales dropped in this period due to lack of availability. Bottomland zones were claimed generally earlier than the upland areas.

Table 5

1867-1876 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest	160.00	1.44%	4	2.99%
Bottomland Forest - Upland Forest	1,853.34	16.74	21	15.67%
Bottomland Swamp	80.00	.72%	2	1.49%
Bottomland Swamp - Upland Forest	80.00	.72%	1	.75%
Upland Prairie	40.00	.36%	1	.75%
Upland Prairie - Upland Forest	200.00	1.81%	3	2.24%
Upland Forest	8,660.14	78.21%	102	76.11%
Total	11,073.48	100.00%	134	100.00%

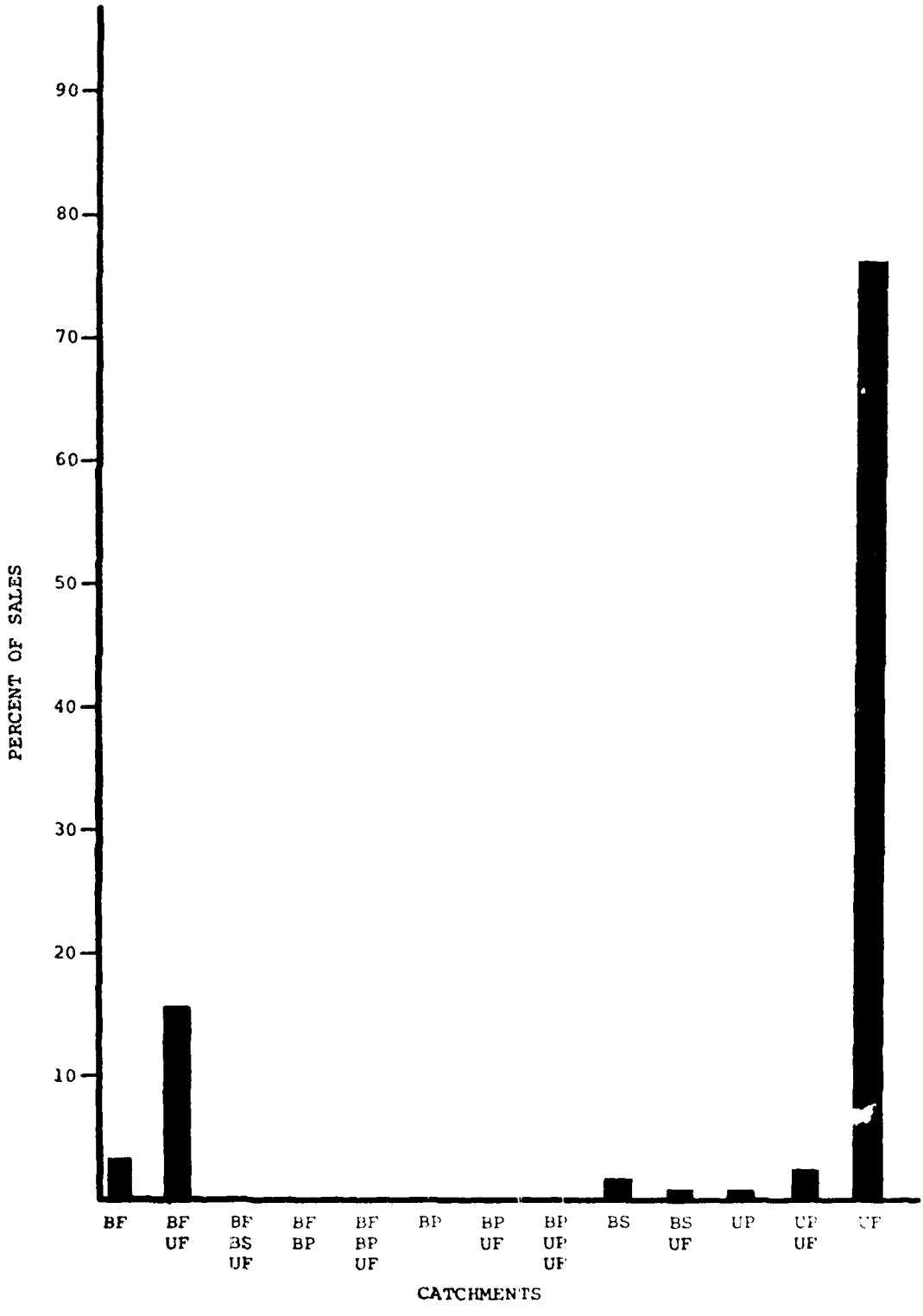


Figure 9. 1867-1876 catchment choices.

1877 - 1886

This period showed a continual decrease in land sales. A total of 124 tracts were sold between 1877-81. Again, this decrease may be contributed to the lack of desirable land. The land chosen, BF, BF-UF, BF-BS-UF and UF catchments, indicate purchases were additions to adjoining ownerships (Table 6 and Figure 10).

The 12 bottomland catchments were swampy and poorly suited for any extensive farming. The BF-UF catchments were purchased within the first three years of sales, while three were claimed the very first year.

Upland forest catchments (112) were bought throughout the first five years, with the majority (78) transacted between 1879-81. Each tract either contained some water source or was bordered by one. The land on both banks of Little Turkey Creek, White Branch, South Fork, Turpin Branch, P. D. Creek, Conley Branch, Salley, Bell, Brown and Montgomery branches were now totally settled. Although the land was of poor quality, the bottomland zones were none the less chosen before the upland areas.

1887 - 1896

There was a sharp increase in sales during this period. The 165 tracts (Table 7) contained BF, BF-UF, BS, UP, and UF catchments.

The bottomland purchases were transacted between 1887

Table 6

1877-1886 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sales	Land Sales in Each Catchment	% of Sales
Bottomland Forest	82.33	.78%	2	1.61%
Bottomland Forest - Upland Forest	591.73	5.60%	9	7.26%
Bottomland Forest - Bottomland Swamp - Upland Forest	80.00	.76%	1	.81%
Upland Forest	9,803.40	92.86%	112	90.32%
Total	10,557.46	100.00%	124	100.00%

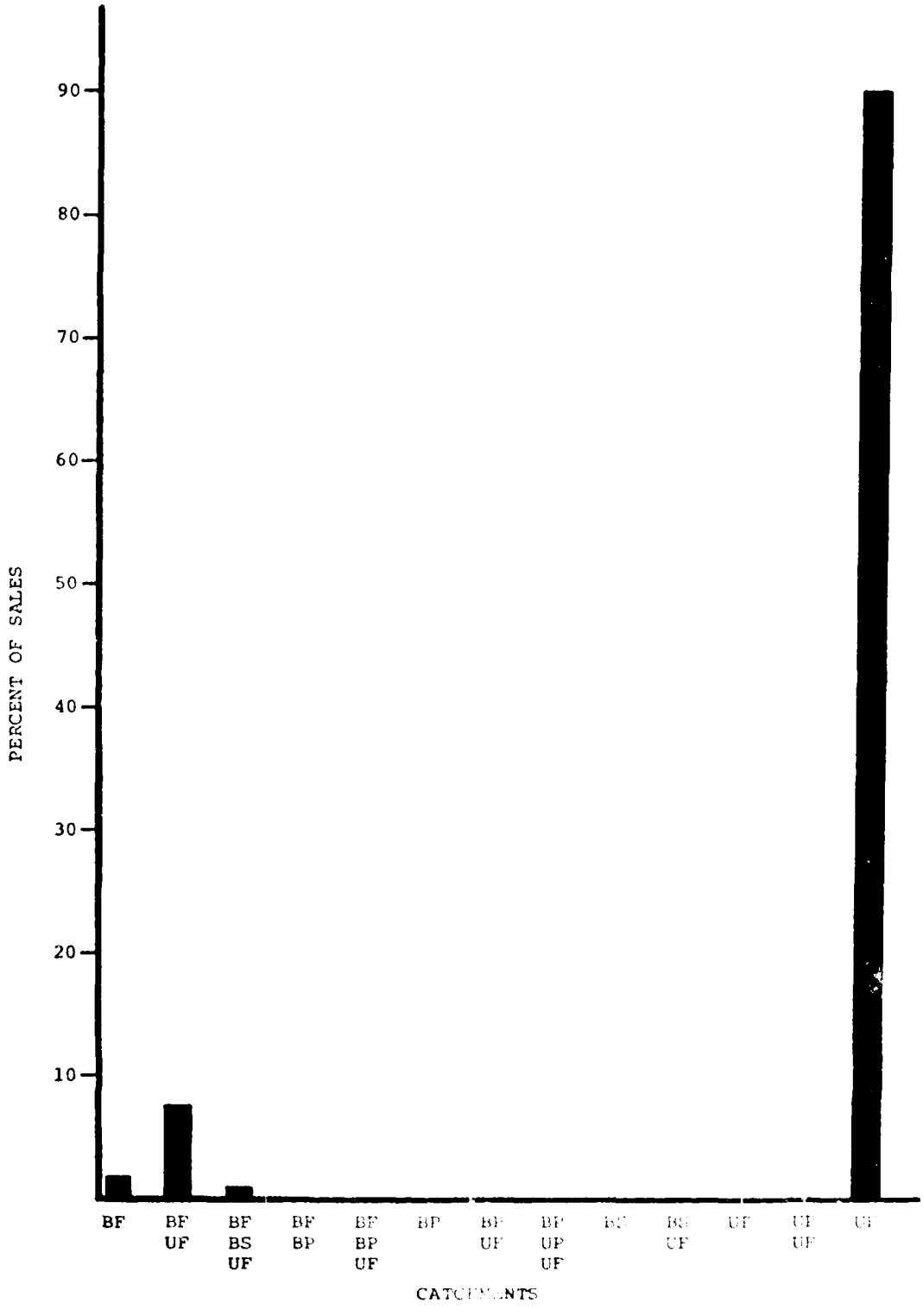


Figure 10. 1877-1886 catchment choices.

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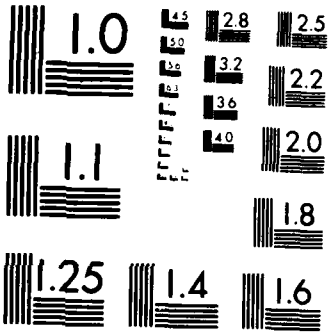

Table 7

1887-1896 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest	62.90	.51%	2	1.08%
Bottomland Forest - Upland Forest	840.00	6.75%	16	8.65%
Bottomland Swamp	40.00	.32%	1	.54%
Upland Prairie	120.00	.96%	1	.54%
Upland Forest	11,375.70	91.46%	165	89.19%
Total	12,438.60	100.00%	185	100.00%

1893. All 19 choices were partial or full swampland and were on the banks of the Osage, Little Pomme de Terre and Pomme de Terre rivers.

The last of the available upland prairie, purchased in 1893, was on the upper reach of Prairie Creek.

Eighty-nine per cent of the sales were upland forest catchments. This may have been a result of the severe flooding in 1894 and 1896. The majority of these sales were after 1895: tracts were generally near or directly on the banks of a water source. The banks of Hogle's Creek and Whig Creek were now fully settled.

Although the bulk of land purchased this period was of poor quality (Figure 11), we assume that individuals were buying these upland areas to obtain additional land above the flood zone, as well as to create a larger resource base.

Only 261.04 acres of bottomland forest and 8320 acres of upland forest remained at the end of this period, thus limiting the choices one could make in the last two periods.

1897 - 1906

Purchases during this period took place over the full ten years. The two bottomland zone catchments (BF-UF and BS) were sold between 1897-1901, while the majority (72) of upland forest areas (Table 8) were chosen after 1902.

The bottomland forest-upland forest catchments completed the settlements along the banks of the Osage and

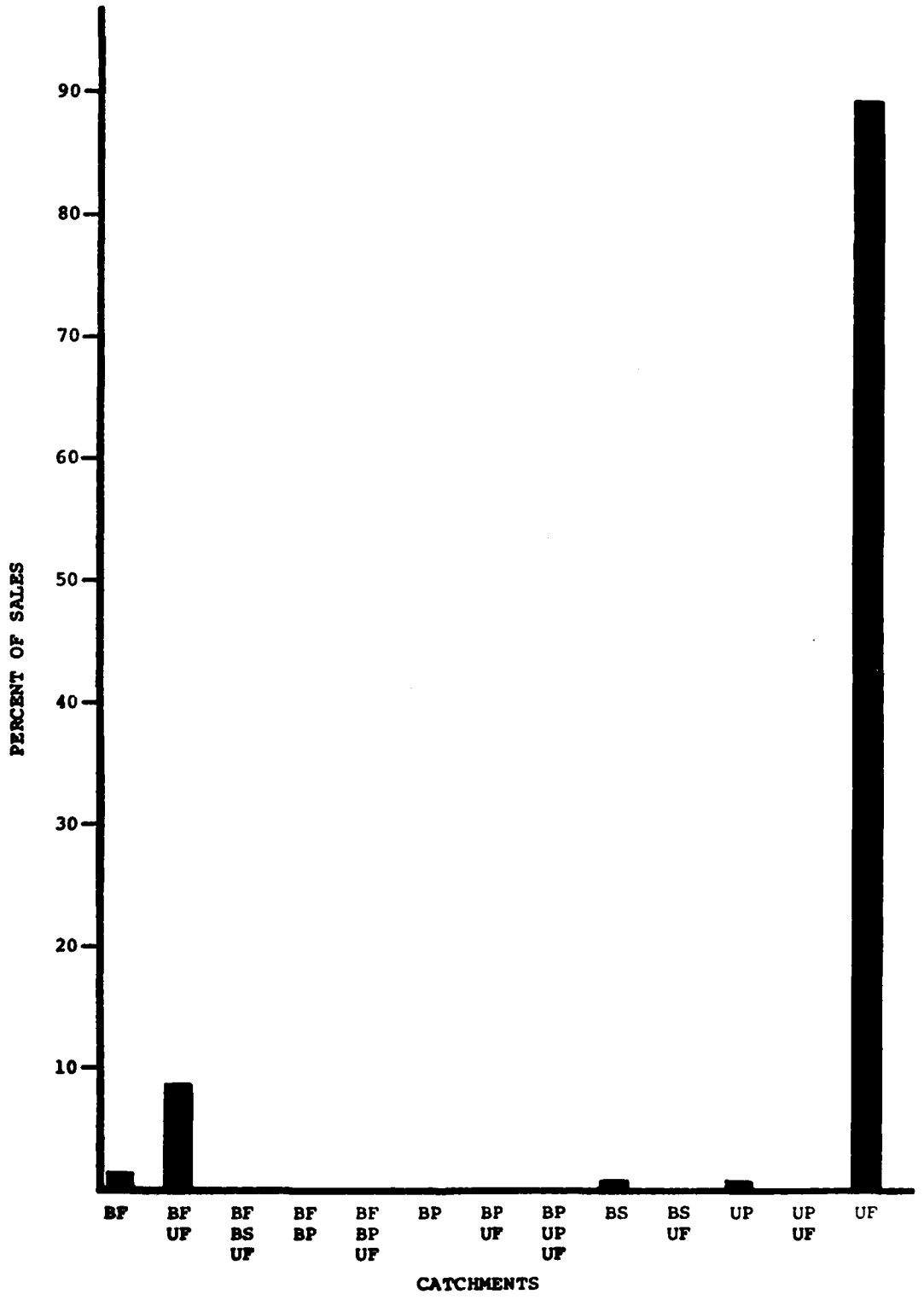

Figure 11. 1887-1896 catchment choices.

Table 8

1897-1906 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest - Upland Forest	331.97	4.76%	4	4.30%
Bottomland Swamp	40.00	.57%	1	1.08%
Upland Forest	6,598.72	94.67%	88	94.62%
Total	6,970.69	100.00%	93	100.00%

Pomme de Terre rivers, while the bottomland swamp location was along an upper extreme of a small feeder stream flowing to the Pomme de Terre River.

Most sales (94.62), consisting of upland forest (Figure 12), were chosen as close to water as possible. As a consequence of sales in this period, only 30 acres of bottomland forest (along the Pomme de Terre River) and 1620.69 acres of upland forest remained. The bottomland zones were sold early in the period, with the upland areas being claimed over the entire 10 years.

1907 - 1917

The patenting of the last 24 tracts (Table 9 and Figure 13) in the study area took 11 years, during which time the financial panic of 1907, the 1908 drought, the blizzards and floods in 1907-15, and America's entry into World War I in 1917 took place.

There is no patterning of sales due to the small number of catchments involved. Only one BF-UF area was available, lying north of the mouth of Trinity Branch on the Little Pomme de Terre River. This tract was bought in 1916. We may assume from the lateness of this purchase that the area involved may have been swamp and was thus not desirable until this time. The rest of the sales consisted entirely of upland forest. None of these tracts contained water, but were evidently purchased either as additions to established catchments or were a new settler's only available choice.

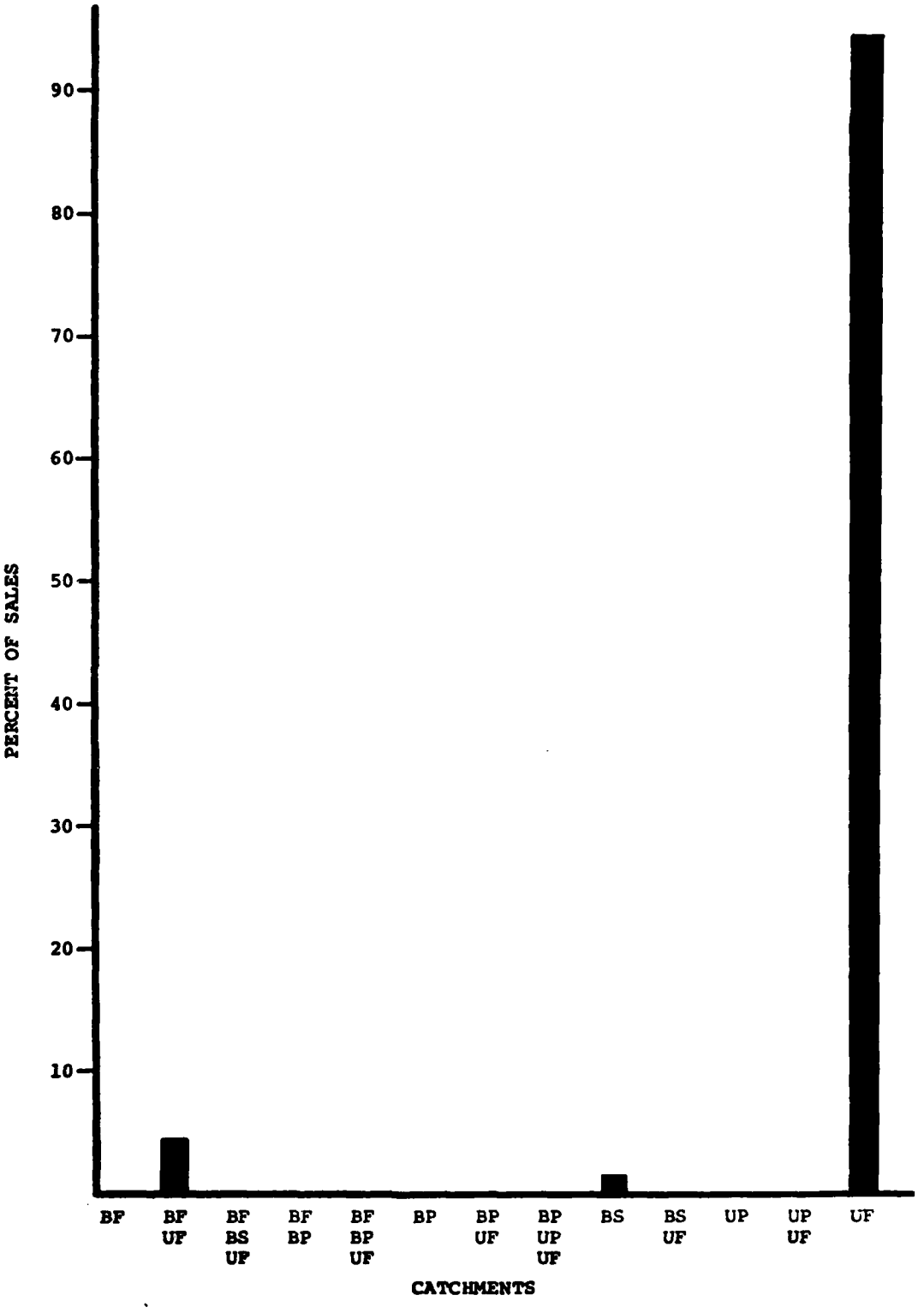

Figure 12. 1897-1906 catchment choices.

Table 9

1907-1917 Catchments: Acreage, Sales and Percentages

Catchment	Acreage in Each Catchment	% of Land Sold	Land Sales in Each Catchment	% of Sales
Bottomland Forest - Upland Forest	64.88	3.93%	1	4.17%
Upland Forest	1,585.81	96.07%	23	95.83%
Total	1,650.69	100.00%	24	100.00%

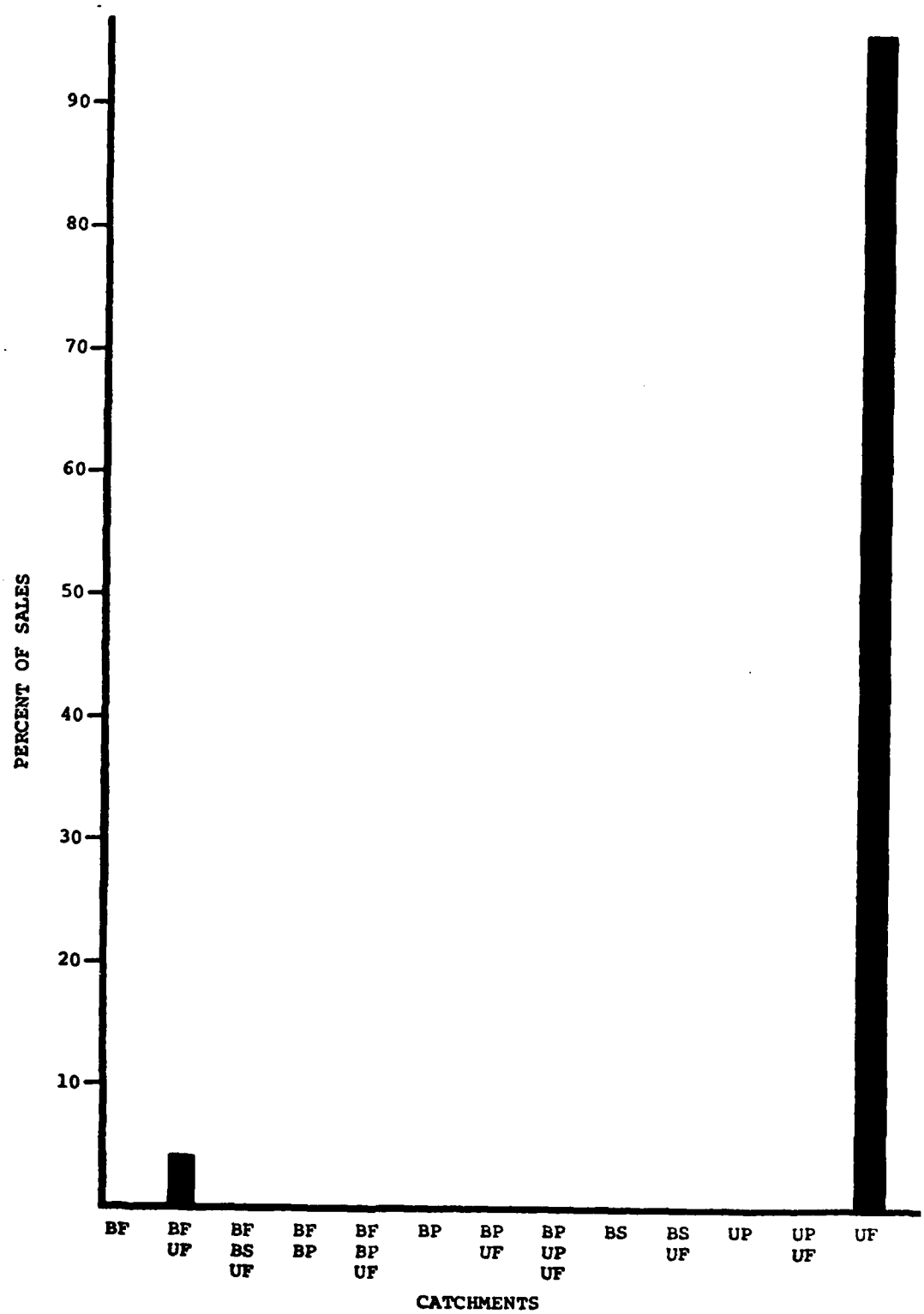

Figure 13. 1907-1917 catchment choices.

CHAPTER V

SUMMARY AND CONCLUSIONS

Spatial relationships are receiving increased attention in archeology, in particular the concept of "site catchment," and vegetational zone aspects to settlement pattern. We have attempted to develop preliminary models pertaining to relationships between Euro-American settlements and the natural environment.

Surveys of original land purchases, land sale policies, and ethnohistoric documentation aided in the analysis of the processes affecting individual decisions in purchasing land. We delineated a series of periods of occupation and attempted to identify that part of the total settlement system of each period within vegetational zones as modeled from historic records. The vegetational zone model and a form of "site catchment analysis" were used to structure a catchment typology to which individual ownerships were related (Table 10 and Figure 14).

On the basis of the analysis of the settlement study we may now attempt to answer the questions phrased in chapter IV.

1. Did people select particular types of environmental situations? If one accepts the immediate resource

Table 10

1837-1917 Catchment Totals: Acreage, Sales and Percentage

Catchment Type	Total Acreage in Each Catchment Type	% of Total Land in Study Area	Total Land Sales in Each Catchment Type	% of Total Sales in Study Area
Bottomland Forest	3,845.40	4.69%	75	5.9%
Bottomland Forest - Upland Forest	9,791.30	11.95%	153	12.04%
Bottomland Forest - Bottomland Swamp - Upland Forest	160.00	.20%	2	.16%
Bottomland Forest - Bottomland Prairie	972.70	1.19%	19	1.49%
Bottomland Forest - Bottomland Prairie - Upland Forest	280.00	.34%	3	.24%
Bottomland Prairie	250.06	.31%	4	.31%
Bottomland Prairie - Upland Forest	769.21	.94%	15	1.18%
Bottomland Prairie - Upland Prairie - Upland Forest	40.00	.05%	1	.08%
Bottomland Swamp	440.00	.54%	11	.87%
Bottomland Swamp - Upland Forest	240.00	.29%	3	.24%
Upland Prairie	1,800.00	2.20%	31	2.44%
Upland Prairie - Upland Forest	2,200.00	2.69%	31	2.44%
Upland Forest	61,134.61	74.61%	923	72.61%
Total	81,923.28	100.00%	1,271	100.00%

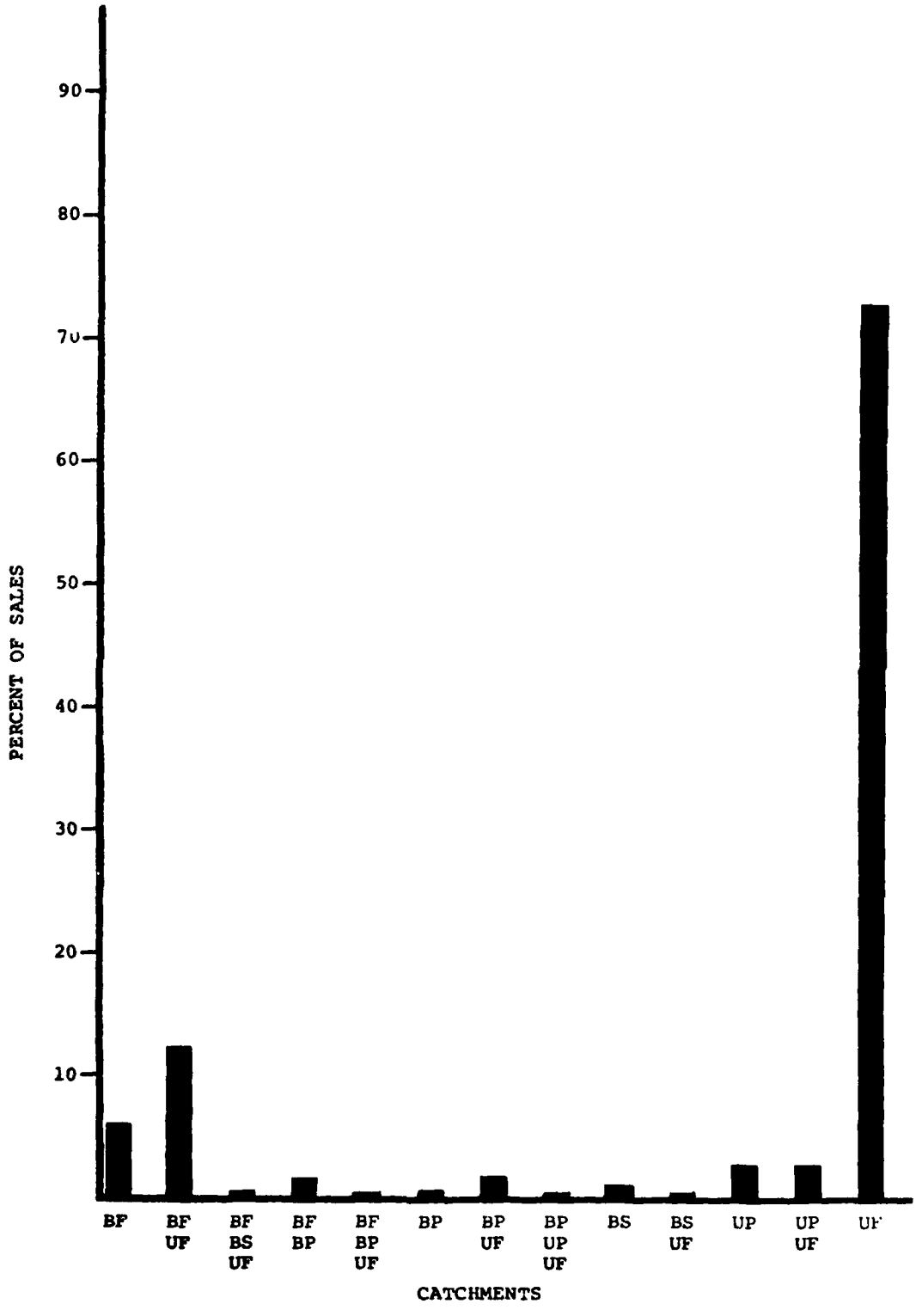

Figure 14. 1837-1917 catchment choices.

base as a representation of the total settlement selection, the answer is yes. However, we have concluded that the only way to gather complete data on the total immediate resource base is to examine all additions and sales of individual ownerships throughout the 81 years. This addition and sale function of the computer program is now being tested.

To add depth to this study, an archeological survey with test excavations will be conducted to gain site-specific data to test for locations of buildings for land use studies within the ownerships.

2. How are these selections distributed in time and space? Is there evidence of a settlement pattern? Three stages of settlement developed during the 81 years. The first stage occupation tends to be only along the banks of the rivers and streams in both bottomland forest-bottomland prairie and upland forest vegetation zones. This two-prong land preference also exists in the other two stages, but in this first stage, selections tend to be spaced, with no directional trends evident.

The second stage shows symmetrical movement upstream and downstream from the first stage selections. There is, as expected, closer packing between claims as well as parcel choices on alternate sides of rivers and streams. There is the additional tendency to settle away from the streams as evidenced by the selection of the interfluve areas. All five zones of vegetation are now represented by the

selections with upland forest zones increasing, since most of the bottomland had been chosen.

The final stage demonstrates movement toward regularity of spacing due to increased overall density, which continued until all land had been selected. Most of the land chosen represented an upland resource base.

3. What evidence is there that certain cultural processes were creating a time/space movement among ownerships? Until further research is completed we can only assume that factors such as Federal Public Land Policies as well as social, political and economic processes had their particular influence on the selection and use of the land after purchase. There are two major problems concerning this question. We must begin to control land selections claimed prior to the official purchase. Recent documentation finds have verified that some early settlers purchased land only after they were pressured by later settlers.

The second major problem connected with simulating the spread of settlement is that relative length of the phases of settlement is unknown. Thus by using arbitrary divisions of time during the 81 years it is evident that similar processes affecting settlement in two connecting ten year phases may appear as different processes or a correlation to any prominent cultural mechanism may be impossible. To minimize this, the next step of the research will match

phases of time with changes in Federal Land Sale Policies as well as other cultural factors.

4. Is there evidence that these choices of land were made in a rational manner? We continue to assume that the majority of land selections were chosen in a patterned manner regarding the resource potential available. There are, however, a number of questions which must be addressed first. Did the people settle in an environment similar to one they had previously occupied? What affect did the distance to the land office have on the purchase date? Did before hand knowledge of the resource base have an affect on the purchase? Were the settlers purchasing land for development or speculation? What influences did ethnic background play in the choice location? All of these and numerous others must be handled in some respects to fully answer our questions on Euro-American settlement.

In concluding this discussion we must briefly point to a number of limitations concerning our study. First, the procedures involved in our approach become less valid when we examine the population movements after the Civil War. There is a substantial increase in the variables influencing settlement patterns that can not be totally documented, so that our data become less controlled and thus unreliable. Therefore, at present our approach is best suited for studies involving less complicated settlement systems.

Secondly, the designated research area for our initial phase of study was delineated as such for its compatibility

with earlier studies carried out within the Lower Pomme de Terre River valley. In doing so, the area does not encompass known protohistoric settlements. This factor introduces a problem when attempting to compare and contrast Euro-American settlement and adaptation patterns to those of protohistoric peoples. Therefore, during proceeding phases of study an area should be chosen within the reservoir which has an overlapping of prehistoric, protohistoric and historic cultures.

Thirdly, we have been hampered by incomplete documentation. This has forced us to speak in generalities and introduce many assumptions concerning early land use and adaptation. It should be pointed out, however, that the accumulated data from this initial study, combined with data from on site excavations, would begin to close some of the gaping holes presently plaguing us.

Finally, two functions need to be added to the present computer mapping system. The capability of computing the physical resources remaining after each period of settlement would enhance our understanding of the choices made during the following periods, as well as demonstrate the depletion of particular resources. Also, a function should be developed to deal with the resale of land after the initial purchase. At present, the data are stored on tape but are not demonstrated in map form. This function may supply us with a better understanding of the overall movement of populations within the valley.

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